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An analysis of children's drawing-
ages - four to fourteen inclusive.

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Service Paper

AN ANALYSIS OF CHILDREN'S DRAWING
AGES FOUR TO FOURTEEN INCLUSIVE

Submitted by

Emma Marie Mahoney

(B.S. in Ed., Boston University, 1931)

In partial fulfillment of requirements for
the degree of Master of Education

1 9 4 6

First Reader : W. Linwood Chase, Professor of Education

Second Reader : Helen A. Murphy, Assistant Professor of Education

Third Reader :

614-75 E.M. Mahoney

School of Education

June 12, 1946

1977

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THE HISTORY OF THE

The history of the city of London, from the first settlement of the Britons, to the present time, is a subject of great interest and importance. It is a subject which has attracted the attention of many of the most distinguished writers of the age, and which has been the subject of many of the most valuable works of history.

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TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
CHAPTER	
I. Review of Previous Research	4
II. The Plan of the Study	33
III. Analysis of Data	38
IV. General Conclusions	68
BIBLIOGRAPHY	70

TABLES

Tabular Presentation of:

Per Cent of Children Showing Different Parts of the Body at Successive Age Levels	13
TABLE I. Distribution of Drawings by Chronological Age	36

INTRODUCTION

INTRODUCTION

The purposes of this study are: (1) to show growth and development on the part of children as revealed in their drawings; (2) to study their drawings with respect to the elements which compose them; (3) to compare the drawings at the various age levels with respect to these elements.

It is important in dealing with children day by day to possess an understanding of the general course of their normal development in so far as it can be discerned. While it is recognized that each child is a unique, interacting individual and also that the developmental process is gradual and continuous throughout life with no sharp divisions of either kinds or stages of maturation, yet it is possible for purposes of analysis and study to concern one's self with a single phase of child activity. Many specialists in child guidance have been interested in studying children's drawings as a means of gaining greater insight into their intellectual development. "Spontaneous drawing serves as a definite form of expression to reveal many conditions of the child's mental life and development which are otherwise inaccessible"^{1/}

^{1/} Fred C. Ayer, The Psychology of Drawing, Baltimore: Warwick and York, 1916, p.59.

Strang says, "A child's drawings show not only the extent to which he can govern his muscles, but also the quality of his observation." ^{1/} Furthermore, "Ability in art in general develops along the line of increasing technical control, accuracy of perception and creative imagination." ^{2/} Also, "There is a close relationship between concept development as expressed in children's drawing and their intelligence." ^{3/}

"Oral language, gesture and drawing are the most universal means by which human beings communicate with each other. Drawing is one of the early means of expression used by the young child." ^{4/}

His drawing is a form of activity by which the young child is able to express his feelings and ideas concerning the factors in his environment of which he is becoming increasingly aware. At first, it is merely motor expression of his subjective feelings, a way of making his ideas visible. It is a form of talking to himself. Soon, however, as he puts more meaning into his scribbling, the child sees that others are interested and are interpreting what he draws. From this crude beginning he learns that his drawing may be a means of conveying his ideas to other people. In this

^{1/} Ruth Strang, Introduction to Child Study, p.304.

^{2/} Strang, op.cit., p. 305.

^{3/} Strang, op. cit., p.451.

^{4/} Stella A. McCarty, Children's Drawings: A Study of Interests and Abilities, Baltimore: Williams and Wilkons, Company, 1924, p.1.

sense drawing becomes a language. "Children's drawings may then be looked upon as a universal language of childhood whereby children of all races and cultures express their ideas of the world about them. They belong not to the realm of aesthetics but to the realm of thought and expression." ^{1/} In many ways, language and growth in drawing are parallel.

For several years as a result of much close observation of children at work in school, the writer has been interested in noting how growth and development have been shown in their drawing, and so she undertook this study.

^{1/} Florence Goodenough, Chapter 14 in : Carl A. Murchison, A Handbook of Child Psychology, Worcester, Massachusetts: Clark University Press, 1931, p.505.

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CHAPTER I

REVIEW OF PREVIOUS RESEARCH

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CHAPTER I

REVIEW OF PREVIOUS RESEARCH

"The idea that the spontaneous drawings of young children may throw light upon the psychology of child development is not a new one. As early as 1885, Ebenezer Cook published an article, "Art Teaching and Child Nature", London Journal of Education, 1885, on children's drawing in which he described the successive stages of development as he had observed them and urged that art instruction in the schools be made to conform more nearly to the mentality and interests of children. Cook's article attracted much attention and had a decided influence on educational practice." ^{1/}

One of the most extensive and carefully controlled studies which have ever been made in this field was carried on by Kerschensteiner (Die Entwicklung der Zeichnerischen, Munich: Begabung, Gerber, 1905) at Munich during the years 1903-1905. Kerschensteiner was appointed to reorganize the course of study in drawing for the folk schools of that city. In order to determine and establish a scientific basis for his work, he spent about two years in the collection and study of nearly 100,000 drawings made under standardized

^{1/} Florence Goodenough, Measurement of Intelligence by Drawing, Yonkers-on-Hudson: World Book Company, 1924, p.1.

2. Summary
Executive Summary of the Report

The purpose of this report is to provide a summary of the findings of the study conducted by the research team. The study was designed to investigate the impact of the proposed changes on the organization's performance. The results of the study indicate that the proposed changes have a positive impact on the organization's performance, particularly in the areas of cost reduction and efficiency. The study also identified several areas for further research and improvement. The findings of the study are discussed in detail in the following sections.

5.1. Summary of Findings
The findings of the study are summarized in the following table. The table shows the impact of the proposed changes on the organization's performance, measured by the following indicators: cost reduction, efficiency, and customer satisfaction. The results show that the proposed changes have a positive impact on all three indicators. The cost reduction is achieved through the implementation of the proposed changes, which have resulted in a significant reduction in the organization's operating costs. The efficiency is improved by the implementation of the proposed changes, which have resulted in a significant increase in the organization's productivity. The customer satisfaction is improved by the implementation of the proposed changes, which have resulted in a significant increase in the organization's customer loyalty.

conditions in Munich and surrounding towns and villages. He classified the drawings on the basis of changes that appeared with age. The three stages that he found are still used by research workers and his study is still considered a basic reference.

Kerschensteiner's classifications were as follows :

1. Purely schematic--the child draws each object according to a fixed scheme little modified by variations in perspective or angle from which it is seen. (Corresponds to the ideoplastic stage of Verworn)- (Max Verworn, "Zur Psychologie de Primitiven Kunst", Fisher, Jena, 1908).
2. Drawing in which the child attempts to represent the object as he sees it. The same object will be drawn in many different ways according to its position with relation to the observer and to other objects in the drawing. (Verworn's physioplastic stage).
3. A still later stage in which definite account is taken of perspective and the child attempts to give an idea of three dimensional space.

"In addition, Kerschensteiner also gives other intermediate or mixed types in which parts of the drawing belong to an earlier stage and the remainder to a later." ^{1/}

Other studies have been done in this same phase of investigation and serve to strengthen or to enlarge the findings of Kerschensteiner. ^{2/} Waddle, in 1918, defined the four stages as follows :

^{1/} Florence Goodenough, in Carl A. Murchison, A Handbook of Child Psychology, Worcester, Massachusetts: Clark University Press, 1931, pp.482-83.

^{2/} C.W. Waddle, Introduction to Child Psychology, Boston: Houghton Mifflin Company, 1918, p.190.

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1. Scribble stage -- from 2 to 5 years.
2. Artistic illusion--from 5 to 12 years. The child is non-critical, imaginative, gives little attention to symmetry and proportion but much to decoration and detail.
3. Self-conscious-- from 12 to 15 years. Many lose interest and give up in discouragement because their techniques are not equal to their standards.
4. Rebirth of artistic ability--15 to 16 years. Occurs only in the case of a small number having artistic achievements better than average. They are interested in the artistic value of the product and regard it as do adults.

McCarty did an elaborate three-year study (McCarty, Stella, Children's Drawings, a Study of Interests and Abilities, Data Collected by the Child's Study Committee of the International Kindergarten Union, edited and compiled under the Direction of Stella Agnes McCarty, Ph.D., Chairman, published by Williams and Wilkins, Baltimore, 1924), from 1919 to 1922 in which she analyzed 31,236 drawings of 12,851 children from the ages of four to eight years, from grades kindergarten through second in twenty-six cities. She also gives four stages preceding the first stage of Kerschensteiner with two others since she was working with younger children.

1. Scribble stage-- the child makes senseless and purposeless marks for the mere satisfaction in manipulating the pencil and seeing something happen.
2. Symbolic stage--usually culminates at about 4 years. Definite meanings are assigned to the scribbles. They become houses, persons, et cetera., according to the child's desire

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BY
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THESIS OF [Name] IN CANDIDACY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN THE DEPARTMENT OF CHEMISTRY
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ABSTRACT
[Detailed abstract text describing the research work, findings, and conclusions of the thesis. The text is too faint to transcribe accurately but appears to be a standard scientific abstract.]

ACKNOWLEDGMENTS
[Text acknowledging the advisor and other individuals who assisted during the research.]

REFERENCES
[List of references cited in the thesis.]

2. and take a place in his imaginative world. He can identify them after several months although an adult can see no resemblance to the object represented.
3. Schematic stage-- Drawings begin to show the definite characteristics of the objects for which they stand. They may have considerable accuracy and show many details, but there is no attempt to show perspective, light and shade, depth, solidity or texture.
4. True representative art--attempt is made to interpret appearances of things through the use of linear perspective, light and shade, and composition. There is an awakened sense of criticism which with some leads to a definite interest in technique. 1/

McCarty points out that no sharp line may be drawn between any two successive stages, but on the whole the primary period roughly coincides with the work through the schematic stage. It is rare for the fourth stage to be reached by any children of these ages. It is likely that the scribble stage is in the last stages of transition into the symbolic stage by the age of four. The symbolic stage merges rapidly into the schematic and these drawings of flat silhouette, bare outline and in two dimensions continue to be produced throughout the period. True representative art appears rarely and maturity changes are seen chiefly in the gradual decrease in the percentage of human beings as subjects and in the increase in nature as a subject. There is a gradual transition from representing isolated or unrelated objects to compositions in which a complete idea is portrayed.

1/ Stella A. McCarty, op. cit., p.133.

Gesell at Yale in a study in 1940 found the following pattern of development:

At 12 months-- marks by banging or brushing

At 18 months-- scribbles but marks off the page

At 2 years -- scribbles but better defined, rarely off the page

At 3 years-- names drawings but hard to see objects in them

At 4 years-- rarely scribbles, drawing takes on form and meaning

At 5 years-- recognizable for what the child names it.

At 6 years-- shows improvement in precision and detail. 1/

In another study with even younger children, Gesell 2/ found that creative activities involving crayons follow much the same pattern as for drawing. He says that at two years, the child's experimentation was largely motor and manipulative; by three, he can control the use of his media; at four, imagination enters into his activities; by five, he begins to be self-conscious about his work.

Gesell 3/ notes the following pattern :

0 - 1 month--reflex grasp of crayon without visual regard

1/ Arnold Gesell, The First Five Years of Life, New York: Harper, 1940, p.142.

2/ Arnold Gesell, Infancy and Human Growth, New York: MacMillan, 1928, p.216.

3/ Arnold Gesell, op. cit., p.216.

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ON JANUARY 15, 1908, RELATIVE TO THE PROPOSED

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- 1 to 3 months--more complex manipulative reactions to crayon, no visual regard.
- 3 to 5 months--increasing visual co-operation. Clasps with two hands favorably presented, picks up crayon on contact with hand.
- 6 to 9 months--reaches for crayon on sight, bangs, crumples, hand to mouth reaction, paper and crayon not in relation for marking.
- 9 to 12 months--gradually brings crayon and paper into productive relationship, staccato marks, wavering scrawl.
- 12 to 18 months--imitative scribble, transient, fitful effort and fugitive attention.
- 18 to 21 months--more defined spontaneous scribble, differentiates between straight and circular strokes.
- 24 to 30 months--imitates vertical stroke, longer attention span.
- 30 to 36 months--makes two or more marks in imitation of square cross.
- 36 to 40 months--imitates horizontal strokes, brings vertical and horizontal marks together for a cross, copies a circle.
- 48 to 60 months--copies cross, draws recognizable man.

Eng, in her elaborate study of the drawings of young children, says, "The study of the early drawing of children shows that a significant and regulated development is found in the apparently valueless and planless drawing. It appears on the one hand as a progress in ability to draw and increasing mastery of line and form; on the other hand, progress in drawing is the expression of the gradual unfolding of the child's soul." ^{1/}

^{1/} Helga Eng, The Psychology of Children's Drawings, London: Kegan, Paul, Trench, Trubner and Co., Ltd., Carter Lane, 1931, 101.

The preceding statement followed a comprehensive study by Eng ^{1/} of the drawings of her niece from the time she was ten months old to eight years old. Eng grouped her drawings made each successive year and compared them with those made the preceding year. She shows their parallelism with other aspects of the child's development such as speech, concepts and interests. She stresses the fundamental similarity between the drawing of present-day European children and those of prehistoric man or those of modern primitive races.

Goodenough sums up the findings of other studies saying, "In spite of wide geographical distribution of the subjects and the great disparity in cultural and racial antecedents, the general similarity of results is indeed striking, the more so since the time at which the different investigations were made ranges over more than a quarter of a century." ^{2/}

Subjects of Children's Drawings

The subjects of children's drawings have been of great interest to psychologists.

Eng says, "An uninterrupted series of a child's spontaneous drawing gives a psycho-graphic representation of the growth of the child's mind during the time when it was developing freely and naturally without any kind of compulsion from school or instructor." ^{3/}

1/ Helga Eng, op. cit.

2/ Florence Goodenough, op. cit., p.482.

3/ Helga Eng, op. cit., p.181.

All studies indicate that with children up to ten years, the human figure greatly exceeds all other subjects. Louise Maitland made this finding first in "What Children Draw to Please Themselves," in Inland Educator, Volume I, (1895), page 87. It was corroborated by similar studies by Ballard in "What London Children Like to Draw", Journal of Experimental Pedagogy, Volume 1, (1912), pages 185-197; by M.D. Katzaroff, "Qu'est ce que les Enfants Dessinent?" Archives de Psychologie, Volume 9, (1910), page 125; with French children ; by McDermott with American Indian children; by Maitland with Eskimo children, and by McCarty with children from various parts of the United States, op. cit., pages 17-18.

McCarty asked the thirty thousand children previously referred to, to draw anything they wished. It was found that 16.5 % of the drawings were of the human form with the adult slightly more popular than the child form. Next came houses, with 13.9 %, trees with 9.3 %. Animals appeared in only 4 %.

Hurlock and Thompson ^{1/}in 1934 asked the same age group (four to eight years) to draw eight objects such as man, tree, girl, etc. They were allowed to use crayons or pencils. 2,292 drawings were made. Color was always used. The younger children said they liked it better, while the older ones believed it to be more appropriate. No interest in design

^{1/} E.B. Hurlock and J.L. Thomson, "Children's Drawings: an Experimental Study of Perception," Child Development, Volume V, pp.127-138.

was shown, but there was an increase in the use of waves, trees, etc. for backgrounds.

Knauber ^{1/} found nursery school children to be interested in anything new with no concern about pattern. The primary children preferred to draw things for which they had learned patterns and from their natural surroundings. He thinks that as children grow older, their work is markedly influenced by their environment and by recent happenings. McCarty ^{2/} believes the meagreness of content may be due in part to an over-emphasis of the formal subjects of the curriculum in the lower grades. Eng also agrees that the human form is the most popular subject. Lena Partridge ^{3/} made a study of the frequency with which children of different ages draw the various parts of the human figure as arms, neck, feet, etc. Table showing per cent of children showing different parts of the body at successive age levels follows on page 13.

1/ A. J. Knauber, "A Study of the Art Ability Found in Very Young Children," Child Development, Volume II, pp.66-71, 1931.

2/ Stella McCarty, op. cit.

3/ Lena Partridge, "Children's Drawings of Men and Women", in Barnes' Studies in Education, Volume II, 1902, pp.162-179.

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Per Cent of Children Showing Different
Parts of the Body at Successive Age Levels

Age	4	5	6	7	8	9	10
<u>Hair</u>							
Partridge	6	26	27	32	38	58	70
Goodenough	16	13	16	22	45	45	58
<u>Neck</u>							
Partridge	8	22	20	37	51	63	79
Goodenough	5	14	26	44	66	74	83
<u>Arms</u>							
Partridge	45	67	71	80	76	85	93
Goodenough	55	64	83	88	91	92	98
<u>Trunk</u>							
Partridge	50	82	92	93	98	99	98
Goodenough	59	74	87	99	99	100	100

Rouma in a careful and detailed study of the development of the drawing of the human figure distinguished the following stages :

a. The preliminary stage.

1. Adaptation of the hand to the instrument
2. The child gives a definite name to the incoherent lines he makes.
3. The child announces in advance what he plans to draw.

4. The child sees a resemblance between lines obtained by chance and certain objects.

b. Evolution of the representation of the human figure.

1. First attempts similar to the preliminary stage.
2. Tadpole stage--consists of large round head, dot or strokes to represent features and an indefinite number of lines for limbs.
3. Transition stage--trunk sometimes appears, limbs and features more distinct. (The average child completes the transition stage by 6 years of age)
4. Complete showing of the human figure (occupies years 6 and 7).
5. Transition stage between full face and profile--many confusions in locating features and alignment of parts (ninth year).
6. The profile. 1/

Eng 2/ describes this progression in detail as shown in her niece Margaret's drawings:

The child at first always draws humans full face, then gradually passes on to represent the profile, but not in such a way as to suddenly produce its figures in full profile. On the contrary, single parts of the body are turned sideways at different times: (1) the feet; (2) the nose; (3) eyes and mouth; (4) arms; (5) body. It is thus that

1/ Georges Rouma, La Langage Graphique de l'Enfant, Paris: Misch et Thron, 1913, p.283.

2/ Helga Eng, op. cit., pp.109-111.

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mixed drawings are produced having some parts profile and others full face. About half the drawings of children six to nine show mixture which may continue up to the thirteenth year, though decreasing.

Eng says that the house is an early and favorite model for the child because he is interested in it and has a well formed mental picture of it; also, it can be drawn by simple and divided squares so familiar to the child.

They begin with the facade, which in its most primitive form is drawn simply as a quadrilateral or rectangle with or without windows, without a roof and often without a door... When they reach a higher stage, they draw windows, door and roof--this being shown as a triangle or a trapezium, but sometimes as a rectangle or a semi-circle. They rarely forget ^{1/}to show several masses of smoke from the chimneys.

Ricci ^{2/}says, "This preference for smoke rising from chimneys, locomotives, tobacco pipes, etc. depends upon the strong impression made by the fantastic movements of the column of smoke upon the little artists."

The Relation of Growth of Visual Perception to Drawing

What facts children perceive in their environment, the extent to which they note changes in appearance of objects because of a changed position of the observer or because of distance are important questions for the psychologist.

Children have a tendency to scale the size of the parts of

1/ Helga Eng, op. cit., p.121.

2/ Carrado Ricci, L'Arte dei Bambini, Bologna, 1887, p.19.

1. The first part of the report deals with the general situation of the country and the progress of the work done during the year.

2. The second part of the report deals with the results of the work done during the year and the progress of the work done during the year.

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7. The seventh part of the report deals with the results of the work done during the year and the progress of the work done during the year.

their drawings to their interest value rather than according to their actual size.

Goodenough ^{1/} explains this interest value thus : "It is more important that people live in houses than that walls are opaque, and hats are more important than hair up to seven or eight years."

Clark, ^{2/} made one of the early attempts to study perception with several hundred children between the ages of six and sixteen. He placed an apple before them with a hat-pin entering the front, extending through it and out the back. He told the children to draw it as it looked to them. Only the third group, the oldest children, used the model. The others drew the facts as they knew them, not as they saw them. Results were as follows:



^{1/} Florence Goodenough in Murchison, op. cit., p.495.

^{2/} A.B. Clark, "The Child's Attitude Toward Perspective Problems," in Barnes' Studies in Education, Vol. I, 1902, pp. 283-294.

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Group I

137 children

Group II

151 children

Group III

Oldest
Children

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DeCroly in another experiment asked children to imagine they were looking out an upstairs window at a man passing on the sidewalk below. The youngest drew the man as seen from a normal angle. The next older drew the house with themselves looking out and the man below at a normal angle. The next group showed conflict in which partial perception of the visual changes was present. These drawings showed a great variety of bizarre forms.

The remarkable consistency in the order of first appearance of the various parts of the human body in the drawings of children the world over as well as the similarity in the methods which they employ for indicating such factors as space, movement, perspective and the like, suggests that the development of perception, like other aspects of development, follows an orderly course which in its broad outlines, at least, is similar for all mankind. 2/

Memory Drawing

"Up to nine years, children tend to draw from memory and prefer to sketch the human figure." 3/

1/ O. DeCroly, "La Psychologie du Dessin," Journal de Neurol-ogie, Volume 17, 1912, pp.421-424 and 441-453.

2/ Florence Goodenough in Murchison, op. cit., p. 495.

3/ Mott, "Development of Concepts," Journal of Genetic Psychology and Pedagogical Seminary, Volume 48, 1936, pp. 199-214.

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^{1/}
Eng says,

The free drawing of children before school age is almost entirely from memory and for the most part remains the same during the early years at school.... Children do not look at the things they wish to represent, but draw them out of their heads from their mental pictures of them.... If they are given a model and asked to draw it, the drawing is, in most cases, influenced very little or not at all by the model; instead, they unhesitatingly follow the memory picture.

In answer to the question as to why children draw from memory, Eng^{2/} says, "In my opinion, the chief reason must lie in the fact that children's drawing is definitely ideomotive, both in its origin and early development."

Kerschensteiner found by comparative experimentation that the results derived from mental pictures were better in most cases than that drawn from nature, and that this was true during all of the school life of children. The nature of the mental pictures which the child follows is not exactly known; but Eng and Buhler^{3/} have concluded that even if the child could hold in memory an accurate mental image of an object, it is not the way he uses it in drawing. They say if this were so, the child would not then bring together in a drawing details which do not belong together, for example, two eyes in a profile. They believe that even if the mental image could be retained and technical difficulties managed,

^{1/} Helga Eng, op. cit., p.124.

^{2/} Helga Eng, op. cit., p.125.

^{3/} K. Buhler, Die Geistige Entwicklung des Kindes, Jena, 1918,

they still would not be able to draw naturally. Investigation has shown that their mental pictures are blurred, indistinct, and incomplete. Buhler ^{1/} says that it is a fundamental law of the imagination to hold fast to orthoscopic forms of objects. It is, of course, true that a child's drawing expresses the play of his imagination as well as his feelings and judgments.

D. Katz ^{2/} set children five to seven years of age to draw a table from a model. All of them drew the table as a rectangle with four legs going outwards from the corners or else from the four sides. All of which is explained by the fact that the child draws what he knows to be correct. This also explains several features of children's drawings which at first are puzzling to the adult. Children draw a man on a horse and show both the man's legs, or they show someone sitting in a boat who can be seen as if the side of the boat were transparent.

Luquet ^{3/} calls this tendency, transparency. This inclination to draw a thing as he knows it appears in a child's drawing of a pool with trees around it. The trees are represented as if they had been cut down and laid with their roots toward the edge of the pool and the trunks away from it. This is called "turning over." The pool may be seen as a circle set upright rather than as an oval. This is known as "setting upright" to distinguish it from turning over.

1/ K. Buhler, op. cit.

2/ David Katz, "Ein Beitrag zur Kenntnis der Kinderzeichnungen," Zeitschrift für Psychologie und Physiologie der Sinnesorgane, Volume 41, 1906, pp.241-256.

3/ M.G. Luquet, "Le Premier Age du Dessin Enfantin," Archives de Psychologie, Volume 12, 1912, pp.14-20.

Luquet ^{1/} has noted the insufficient power of observation of young children and also their defective technique and has described this condition as want of synthesis.

This is shown when parts of the drawing are arranged in a manner not in accordance with reality. One child often drew the nose below the mouth. Defective power of synthesis is also shown in children's talking. The same thing has been apparent in the art work of psychically abnormal people. Some gifted artists have been known to become deranged and their work fall to the level of children's work and show only muddled and disordered detail with no leading idea. All of which goes to prove that judgment must be present, if memory arrangements are to produce true results in children's drawing.

Perspective

Investigations have been made by Passy, ^{2/} Clark, ^{3/} Kerschensteiner ^{4/} and Rouma ^{5/}. Passy found that children do not perceive how dimensions of objects vary with the distance and that they do not grasp perspective changes in the form of objects. In the case of a book, it appears nonsensical to a child that a rectangular object should cease to be a rectangle and that the shorter sides should appear the longer.

Kerschensteiner summarized his results as follows :

1. The development of power of perception as regards the representation of a spatial whole does not take place in parallel with that for the representation of a single self-contained object.
2. The first stage of graphic representation of space is either complete absence of space or the setting of the various objects contained in space alongside one another.

1/ M.G. Luquet, op. cit., pp.14-20.

2/ Jacques Passy, "Notes sur les Dessins des Enfants," Revue Philosophique, December, 1891, pp.514-621.

3/ A.B. Clark, op. cit., pp.283-294.

4/ George Kerschensteiner, op. cit.

5/ Georges Rouma, op. cit., p. 129

3. The second stage includes drawings which are either a conscious attempt at space representation which does not succeed for one reason or another or else successful but incomplete representation.
4. Faultless representation is the last stage and rarely occurs before fifteen and then only by imitation. ^{1/}

Rouma^{2/} distinguished five stages in space representation :

1. A beginning stage in which the objects are scattered about the sheet as they occur to the child with no attempt at order.
2. A period of linear space in which objects are arranged along a line.
3. A period of ranked or divided space with objects in rows, regular or irregular, one above the other, the upper being the farther object.
4. A transitional period in which the child brings the objects in the successive rows into relationship with each other.
5. Final stage in which there is recognition of perspective and of the relation of size to distance.

Orientation and Spatial Displacement

Lack of correct power of orientation shows up in various ways in young children's drawings. The child brings the parts of a mental picture together in incorrect relationships to one another as in the case of one five year old who scattered a roof, four windows and a door all over a paper and said it was a house. Another form of it is shown by a child who drew trees and dogs upside down. Rouma reports several normal and intelligent children of three to five years who drew human figures standing on their heads, horizontally or at angles. Some produced mirror pictures.

^{1/} George Kerschensteiner, op. cit., pp.21,22.

^{2/} Georges Rouma, op. cit., p.129.

Albien^{1/} found when he asked boys nine to thirteen to draw a pattern of lines partly from memory, 18% of them drew it horizontally instead of correctly upright. There was not a case of this among boys thirteen to eighteen. Eng feels that upside down writing or mirror writing are the results of this deficiency in the sense of orientation in space.

Stern^{2/} asked his son to draw a ship from memory and then to draw it upside down and then at an angle of 90° degrees. The results were about equally good. It has been observed often that children comprehend pictures about as well upside down as when in the correct position. The reason for this spatial displacement has been thought to depend on disturbances of muscle innervation or the inversion of the image on the retina which children have not learned to understand correctly.

Eng says, "The reason is now sought, however, chiefly in our comprehension of space, which according to the latest investigation appears to be partly the result of our experience and connection of images. It is, in other words, learned and not inborn, at any rate, not to the extent once assumed."

1/ Gustav Albien, "Der Anteil der nachkonstruierenden Tätigkeit des Auges und der Apperception an dem Bahalten und der Wiedergabe einfacher Formen," Zeitschrift für experimentelle Pädagogik, Volume 5, 1907, pp. 133-156, and Volume 6, 1908, pp. 1-48.

2/ W. Stern, Über verlagerte Raumformen, Z Ang Ps., 2, pp. 498-526, 1909.

Stratton^{1/} experimented with himself. He bandaged one eye and by a certain combination of lenses gave himself the effect of inverting the image on the retina. At first he had great difficulty with right and left and up and down, and with dressing and eating, and similar activities. But after a few days he felt at home in his new surroundings and in a week he could get around in his inverted world without much difficulty, according to Eng.^{2/} Eng says also,^{3/} "It is further maintained our comprehension of single space forms is more original and firmer than that of their orientation in space; this latter is dependent in a high degree upon experience and hence it is still uncertain in the case of children." Spatial displacement is thought to occur more frequently in children who are naturally of marked visual type.

Rouma's summary is as follows :

The chief cause of spatial displacement must probably be sought in the fact that the associations between individual space forms and surrounding space, or the structural foundation of the perceptual world of the child, are less firmly practiced in the case of children than in the case of adults. Hence, spatial displacement occurs in the case of new forms unknown to the child. ^{4/}

1/ G.M. Stratton, "Vision without Inversion of the Retinal Image," Psychological Review, Volume 4, 1897, pp.341-360; pp.463-481.

2/ Helga Eng, op. cit., p.145.

3/ Helga Eng, op. cit., p.147.

4/ Georges Rouma, op. cit., p.112.

Movement

Representation of movement is one of the weakest points in children's drawings. Their human beings are stiff and rigid, with immovable limbs, and only the gifted children adequately show gestures. Rouma^{1/} has found four stages as follows :

1. Persons or objects are drawn according to stereotyped schemes and the children described action by words or gesture.
2. Movement is indicated, but only in relation to another pictured object (an arm extended long enough to reach the flower to be picked).
3. Movement is represented independent of surroundings--it is partial and confined to one part of the body, the others being unchanged.
4. Drawing of entire figure is modified in accordance with the action. Many individuals never reach this stage.

Others have studied the problem in various ways, but they agree that in this, as in other technical aspects, an orderly course of development takes place.

Proportion

Lack of proportion is most noticeable in children's drawings. This is seen both in regard to the relationship of different parts of an object and also in respect to the relationship of persons and objects to one another. Some common mistakes children make are people as tall as houses, horses half as large as persons, heads, feet, boots, buttons

^{1/} Georges Rouma, op. cit., p.248.

CHAPTER I

THE first object of this work is to show that the

principles of geometry are not self-evident

and that they are not deducible from any

other principles.

§ 1.

It is a common opinion that the principles of geometry are self-evident and that they are not deducible from any other principles.

But this is a mistake. The principles of geometry are not self-evident and they are not deducible from any other principles.

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CHAPTER II

THE second object of this work is to show that the

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and that they are not deducible from any

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The principles of geometry are not self-evident and they are not deducible from any other principles.

The principles of geometry are not self-evident and they are not deducible from any other principles.

THE third object of this work is to show that the

all too large. As has been said before, the chief reason is that children make largest the thing which, at the moment, holds the greatest interest for them. Another reason, too, is from want of room on the paper which was not taken into account when planning the drawing.

Color

Children's responses to color have been studied by about twenty investigators using various methods and materials. These materials have been usually colored papers which were not, of course, pure colors and which have a definite texture as well. Generalizations from such materials should not be made freely, but the following conclusions are fairly well agreed upon :

1. Infants of 70 days discriminate between red, orange, green, and blue-green when brightness differences are eliminated. (Chase, 1937).
2. Four colors are clearly differentiated by 15 months. (Staples, 1932).
3. Children between eight and twenty-four months are most effectively stimulated by red, yellow, blue and green in order. (Holden and Bosse, 1900).
4. Groups of four and five year olds stated that orange was a favorite color, with pink and red next. ^{1/}

Williams (1933) and Walton(1933) found as early as four years, children were sensitive to color harmony when asked to choose a colored scarf to go with a colored dress on a

^{1/} Edward B. Greene, Measurements of Human Behavior, New York: Odyssey Press, 1941, p.401.

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doll, but that group averages did not exceed until the eighth year. There was a gradual increase in scores until the twelfth year. ^{1/}

Eng reported that in drawing, children begin with lines and outline their work with a colorless outline. She found that it is about the age of six when they prefer color to a lead pencil. When they use color in drawings they use the color of the object seen near at hand. That is, a tree is green and brown always. "It is very late and rarely without being told that children go so far as to represent natural color and color perspective." ^{2/}

Hurlock says, "Throughout the early years of childhood, the child shows more interest in color than in form, and prefers crayons or paints to the use of pencil." ^{3/} There appears to be a difference in the conclusions of Eng and Hurlock regarding the use of color. This may be due to the fact that neither reports definite age level in their descriptions of beginning work.

Individual Differences in Drawing

Elementary school teachers have very generally had the experience of having in their classes some children who seemed

^{1/} Edward B. Greene, op. cit., p.401.

^{2/} Edward B. Greene, op. cit., pp. 401-402.

^{3/} E.B. Hurlock, Child Development, New York: Mc-Graw-Hill Book Company, 1942, p.412.

1900, the first annual conference of the National
Board of Christian Workers, held at the
Hotel Hamilton, New York.

The conference was held at the Hotel Hamilton,
New York, from December 1st to 10th, 1900.
The first day was devoted to the opening
session, and the second day to the
report of the National Board of Christian
Workers for the year 1900. The third day
was devoted to the report of the
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The tenth day was devoted to the report of the
National Board of Christian Workers for the year 1900.

REPORT OF THE NATIONAL BOARD OF CHRISTIAN WORKERS

The National Board of Christian Workers, organized in 1855,
has during the year 1900, been engaged in the following
work:

1. To promote the Christianization of the heathen.
2. To promote the Christianization of the Mohammedans.
3. To promote the Christianization of the Jews.
4. To promote the Christianization of the Chinese.
5. To promote the Christianization of the Japanese.
6. To promote the Christianization of the Koreans.
7. To promote the Christianization of the Siam.
8. To promote the Christianization of the Annam.
9. To promote the Christianization of the Laos.
10. To promote the Christianization of the Cambodia.

to draw with ease and pleasure and to produce results which were satisfying to themselves; on the other hand, they have had in those same classes children who seemed to have little ability in this form of self-expression. Meumann made an analysis of the drawing act and found it to be dependent upon several factors :

1. Visual activities such as eye movements which underlie the appreciation of distance, direction, etc.
2. Activities of eye and hand involving motor control.
3. Apperceptive ideas involving a strong intellectual element. 1/

Hence he adds, "There must be: (1) association of eye and hand movements; (2) association of visual memory and hand movements, and (3) association of these elements and apperceptive factors." 2/

In trying to discover the weaknesses of those who do not draw well, Meumann finds one or more of the following deficiencies show up :

1. Analytical observation is lacking, either because of inability or unwillingness.
2. Visual imagery is defective or transitory.
3. Eye-hand co-ordination is defective.
4. Imperfection of the actual work interferes with the memory image.
5. Related drawing schemes are lacking.
6. Manual skills are defective.
7. Inability to understand and portray three-dimensional space; to escape from a childish idea that all that exists must be shown. 3/

1/ Ernst Meumann, "Ein Program zur psychologischen Untersuchung des Zeichens," Zeitschrift fur padagogische Psychologie, 1912.

2/ Ernst Meumann, op. cit.

3/ Ernst Meumann, op. cit.

THESE DIFFERENT KINDS OF RELATIONS ARE THE BASIS OF THE
SOCIAL ORDER, AND IT IS THE DUTY OF THE GOVERNMENT TO
MAINTAIN THEM IN A PROPER MANNER. THE GOVERNMENT
SHOULD BE AWARE OF THE FACTS OF LIFE, AND IT
SHOULD BE ABLE TO DEAL WITH THEM IN A WISE MANNER.

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Meier, in 1939, after a ten-year study described six patterns which he believed to be important in the graphic arts :

1. Manual skill--fine eye and hand co-ordination which can be noted at an early age.
2. Energy output--unusual concentration on a task for long periods.
3. Intelligence--usual I.Q. scores above average especially in visualizing and speed of perceiving rather than number and technical vocabularies
4. Perceptual facility--ability to recall sensory experiences
5. Creative imagination
6. Aesthetic imagination 1/

The above items were not to be considered separately by Meier so much as to be descriptive of a complex and inter-related pattern. He believes the first three are primarily inherited through a long line of ancestors and the last three limited definitely by inheritance. The last two seemed to be found in artists and to distinguish them from non-artists.

Tiebout and Dreps ^{2/} in 1938 found that the average scores of children and adults who were rated as artistically superior exceeded significantly the average scores of similar groups rated as inferior in the following tests :

1/ N.C. Meier, "Studies in the Psychology of Art", Psychological Monographs, No. 51, pp.1-158.

2/ Edward B. Greene, op. cit., p.412.

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY

1. The first part of the paper is devoted to a discussion of the general principles of the method of moments, and to a description of the apparatus used in the experiments.
2. The second part of the paper is devoted to a description of the experimental results, and to a discussion of the results in terms of the general principles of the method of moments.
3. The third part of the paper is devoted to a discussion of the results in terms of the general principles of the method of moments, and to a description of the apparatus used in the experiments.
4. The fourth part of the paper is devoted to a discussion of the results in terms of the general principles of the method of moments, and to a description of the apparatus used in the experiments.
5. The fifth part of the paper is devoted to a discussion of the results in terms of the general principles of the method of moments, and to a description of the apparatus used in the experiments.

It is well known that the method of moments is a powerful tool for the analysis of experimental data. In this paper, we shall discuss the general principles of the method of moments, and describe the apparatus used in the experiments. We shall then describe the experimental results, and discuss the results in terms of the general principles of the method of moments. Finally, we shall discuss the results in terms of the general principles of the method of moments, and describe the apparatus used in the experiments.

1. Completeness and accuracy of visual observation on the Heilbronner and Lewerenz tests.
2. Recall of observed material after ten days to six months intervals.
3. Uniqueness of interpretation of ink blots (Knox), (Fernald).
4. Originality of line drawing (Lewerenz).
5. Form discrimination
6. Feature discrimination (Greene)
7. I. Q.'s
8. Aesthetic judgment.

Kik^{1/} made a study based on Kerschensteiner's discovery of three children of superior ability and his own discovery of ten. He found that they could be divided roughly into two groups-- those who showed real creative ability in art and those who were merely good copyists. The former were high in their general school work, but the latter did inferior school work.

Goodenough in comparing the findings of the investigators in the field believes that the following conclusions are justified :

1. In young children, a close relation is apparent between concept development in drawing and in general intelligence. ^{2/}

^{1/} C. Kik, "Die ubernormale Zeichenbegabung bei Kindern," Zeitschrift fur angew. Psychologie, Vol.II, 1908, pp.92-149.

^{2/} Florence Goodenough, op. cit., p.12.

2. Drawing to the child is primarily a language, a form of expression, rather than a means of creating beauty. 1/

Moore says, "The case for or against art ability as a specific talent still rests more on opinion than on factual studies.... The present data seem to point to art ability as a combination of general traits. 2/

Drawing and Mental Disorder

The drawings made by people having mental disorders differ noticeably from those made by normal people. The mentally disordered person reveals his disturbed condition in his drawing. The work of schizophrenic groups differs in significant ways from that of the manic-depressive groups. Most of this work, however, has been done with adults, since mental disorder other than mental deficiency is relatively rare in early childhood. However, many authorities believe that the foundations of mental disease are laid in the maladjustments of childhood. If this is true, it is possible that children's drawings which are so closely related to to their mental life may reveal these early traces and make earlier treatment possible.

Goodenough has shown that for a small group "selected on the basis of marked deviations in drawing from those

1/ Florence Goodenough, op. cit., p.12.

2/ Moore, Encyclopedia of Educational Research, New York: 1940, p.59.

characteristics of normal children of their age and sex, the ratings of personality traits given by teachers were considerably less favorable than those given by the same teachers to children whose drawings were of the usual type."^{1/}

Rouma^{2/} also found a remarkable degree of incoherence and flightiness in the drawings of a child whose general behavior and especially his pathological lying were so extreme as to cause the child to be regarded as having a psychopathic condition. While these cases are few when combined with those of other investigators to be considered reliable, nevertheless, they indicate a need of further study and research on the subject.

Rouma states that the drawings of subnormal children resemble those of younger normal children. He notes, however, the following characteristics of the subnormal children :

1. A marked tendency to automatism
2. Slowness in the evolution from stage to stage
3. Frequent regressions to an inferior stage
4. Numerous manifestations of the flight of ideas as shown by drawings which cover a page but are not finished and deal with unrelated ideas
5. Many subnormal children show great anxiety to represent all details possible in a sketch
6. They prefer drawings in which the same movement recurs frequently
7. They do meticulous work. ^{3/}

^{1/} Florence Goodenough, op. cit., p.12.

^{2/} George Rouma, op. cit., p.283.

^{3/} Georges Rouma, La Langage Graphique de L'Enfant, Paris: Misch et Thron, 1913.

Relation Between Children's Drawings
and Those of Primitive Man

Children's drawings and those made by primitive peoples show many common characteristics. Lack of perspective, methods used to indicate space, transparency in the representation of opaque objects and a tendency to automatism have all been found to have been similarly treated. Confusion in profile drawing among the natives of North Australia is shown by the fact that in their bark drawings they nearly always show two eyes. Internal organs such as backbone, heart, etc., are shown which is illustrative of transparency. Children seldom do this because they do not have this acquaintanceship with animals such as the natives do in their hunting. A difference is shown in that, up to the age of eight, children prefer to draw the human form while primitive peoples prefer to represent animals. Also, the drawings of primitive man are full of action while children's pictures tend to be static. In spite of these differences, there is sufficient evidence to warrant the belief that in its essential features at least, the developmental stages of drawing are similar for all mankind.

CHAPTER II

THE PLAN OF THE STUDY

CHAPTER II

THE PLAN OF THE STUDY

In order to discover what children's drawings might reveal concerning their growth and development, it was necessary to secure many examples of children's work at the various age levels. It was desired to obtain drawings which would be as spontaneous and as uninfluenced by direct adult teaching as possible. Consequently, in co-operating schools similar materials and subjects for drawing were used. Because of children's general interest in houses and people those two subjects were selected for the drawings. The following directions were given to each group of children for the first drawing : "Draw a house which you like on the piece of paper which you have. Use your pencil or your crayons or both as you wish. Make your drawing as interesting as you can."

When this had been done, a second drawing was secured by the use of the following similar set of directions : "On your next piece of paper draw the people who might live in the house which you have just drawn. Use your pencil or your crayons or both as you wish. Make your drawing as interesting as you can."

The children were given sheets of six by nine manila drawing paper or foolscap of approximately the same size. Care was taken that each child was supplied with crayons and pencils. The teachers were asked to see that each child's name, grade and age were written on each paper. Thus there were secured two drawings; one of a house, and one of people from each child. No further suggestions were given except in cases where children asked questions such as the following :

"Could I make up the people who live in the house ?

Do we have to make a sky ?

Shall I draw a woodshed on the house ?

Shall I have a lawn ?

May I use comic people ?

May I draw a river behind the house ?

Do we color the house ?

Are you supposed to put the names under the people you have drawn ? "

In answer to these questions, the teachers used the following replies: "Do what you would like to do." Or else, "Use your imagination."

Schools in three different communities were used in the study. City A has a population of approximately 70,000. The art is directed by special supervisors. City B has a

population of approximately 18,000 and has no arts supervisor at the present time, although it has had such supervision until this current year. The third school system used was that of Town C of approximately 4,000 population. The drawing there is under the guidance of a special supervisor.

The groups were compared on the basis of chronological age. No attempt was made to compare the drawing in the three systems, as the purpose was to study development as revealed in children's ideas expressed through drawing and not to study their drawings from the standpoint of artistic merit. Grade groupings have been disregarded except when individual differences were being considered.

The following table shows the number of drawings which were received from the children in the various age groups of the several schools.

Table I
Distribution of Drawings by Chronological Age

Age	City A.	City B.	Town C.	Total
4	62			62
5	91	20	59	170
6	259	24	64	347
7	239	30	123	392
8	166	26	65	257
9	99	44	92	235
10	115	58	93	266
11	121	26	67	214
12	51	10	81	142
13	54	8	75	137
14	12		31	43
15	2		12	14
16	2		8	10
Total	1273	246	770	2289

The writer analyzed the 2289 drawings considering the following characteristics in each one :

1. degree of regularity of line
2. relative complexity of ideas
3. coherence of related ideas
4. completeness of execution
5. creative power
6. individual peculiarities

The drawings were also examined to discover what they might reveal with respect to :

1. growth through successive grades
2. periods of drawing
3. stages of representing the human figure
4. stages of representation of movement
5. spatial orientation
6. stages in representation of perspective
7. narrative drawing
8. proportion
9. individual differences
10. particular difficulties
11. color

CHAPTER III

ANALYSIS OF DATA

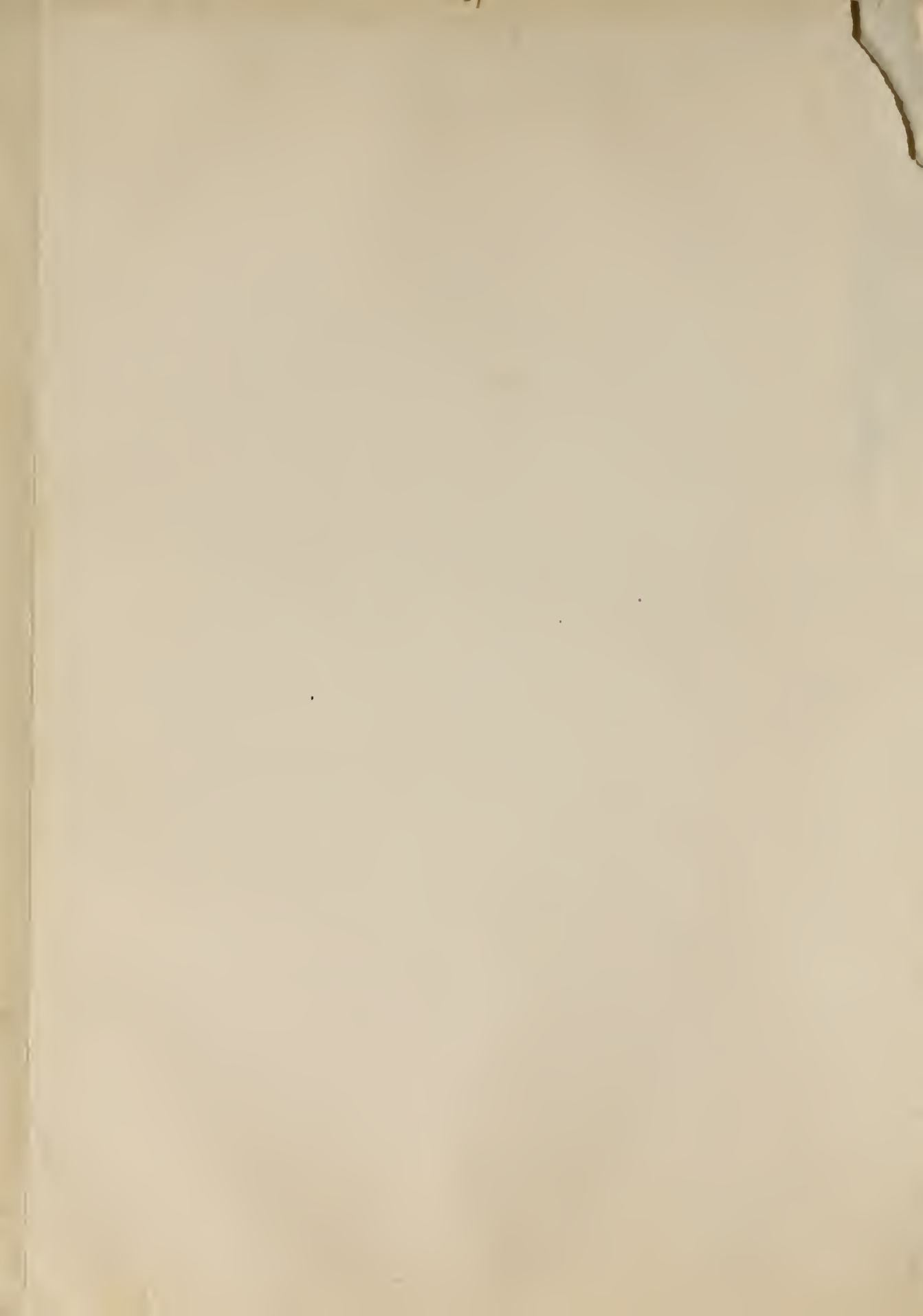
CHAPTER III

ANALYSIS OF DATA

Growth through successive age levels as shown in figure and house drawing. A study of growth and progress as shown in the drawings of children of various age groups must take into consideration the fact that the individual child whose drawing is being evaluated may differ markedly from other children of the same age. Consequently, in attempting to show developmental progress through the ages of four to twelve years, a selection has been made at each age level of a drawing of high, of average, and of low quality. Since some children were more successful in figure drawing and others were more successful in house drawing, sampling was made from both types of subject matter. Examination of the accompanying drawings will reveal a steady growth from one age level to the next, but it will also reveal much overlapping among consecutive age levels. This overlapping appears to be accounted for in many cases by the marked retardation of slow-learning children.

In selecting samples from the total collection of 2289 drawings, the following factors were considered in evaluating each drawing :

Figures 7-8-9



Figures 10-11-12

Growth in Figure Drawing

Quality

High



Age

10

Average



10

Low



10

Quality

High



Age

11

Average



11

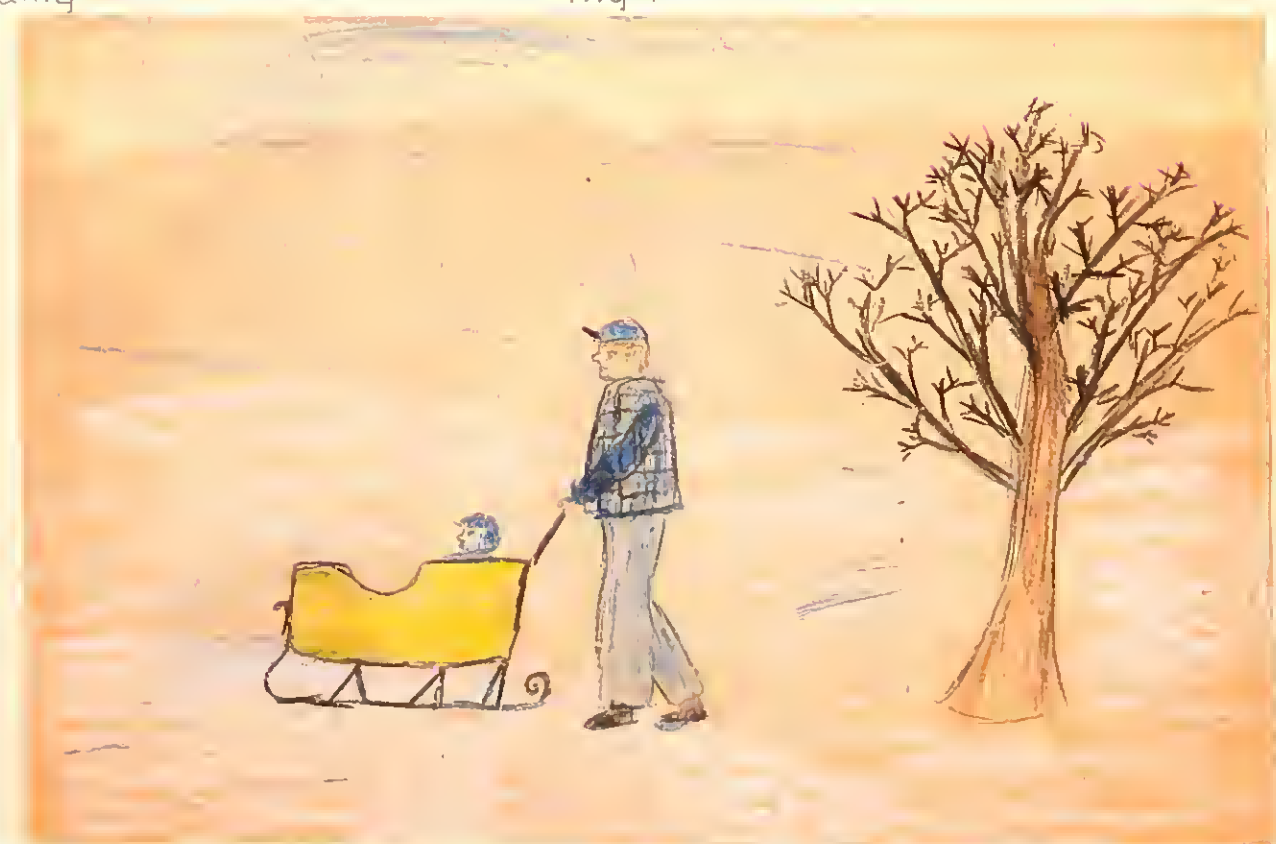
Low



11

Quality

High



Age

12

Average



12

Low



12

Figures 10-11-12

Houses 4-5-6

Growth in House Drawing

Quality

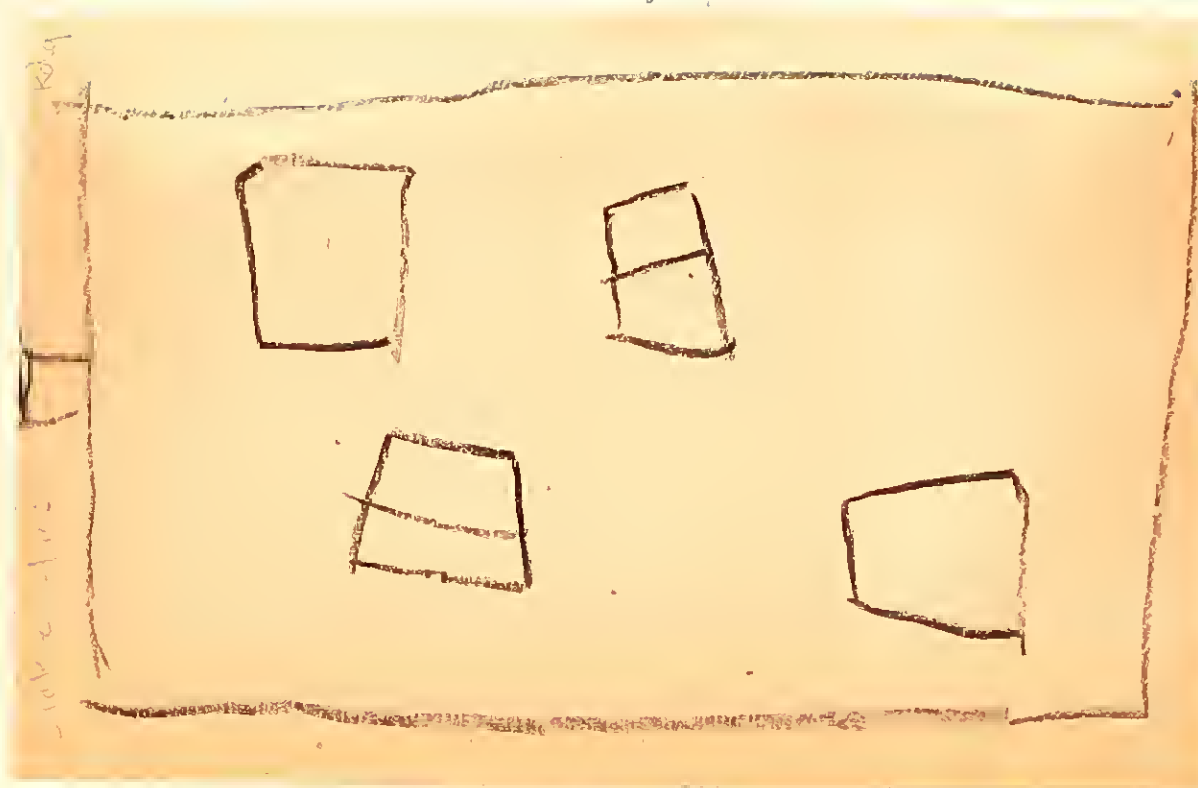
High



Age

4

Average



4

Low



4

Quality

High



Age

5

Average



5

Low



5

Quality

High



Age

6

Average



6

Low



6

Houses 7-8-9

Quality

High



Age

7

Quality

High



Age

8

Quality

High



Age

9

Average



7

Average



8

Average



9

Low



7

Low



8

Low



9



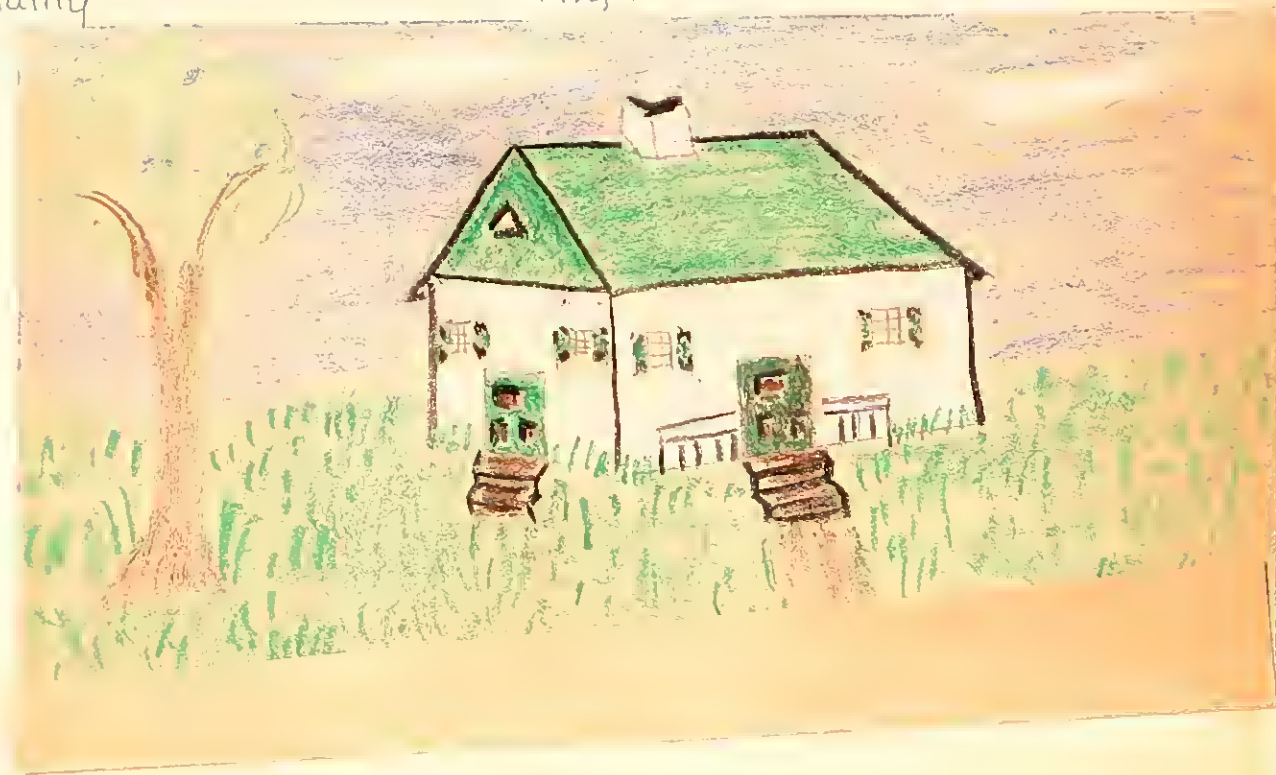
Houses 10-11-12

Houses 10-11-12

Growth in House Drawing

Quality

High



Average



Low



Age

10

Quality

High



Average



Low



Age

11

11

11

Quality

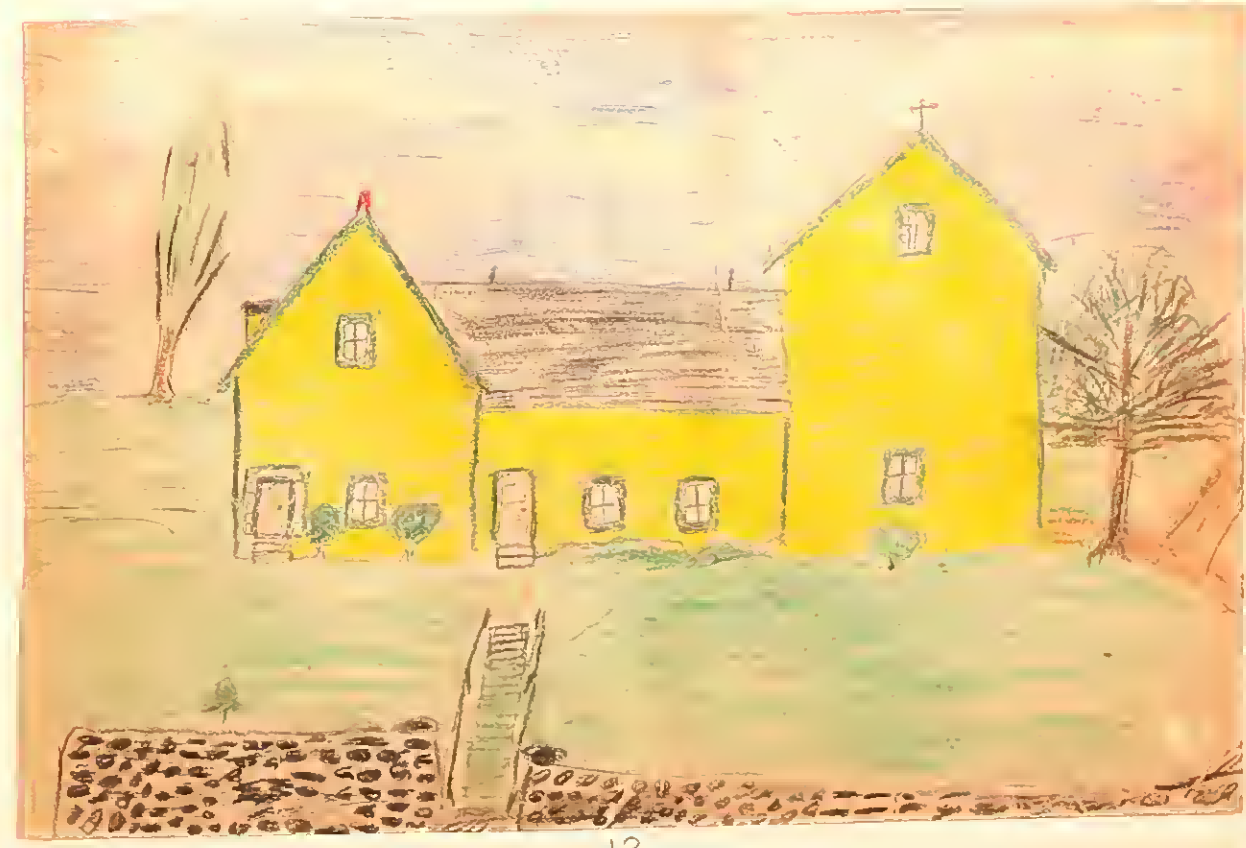
High



Average



Low



Age

12

12

12

1. degree of regularity of line
2. relative complexity of ideas
3. coherence of related events
4. completeness of execution
5. creative power
6. individual peculiarities

General Periods of Drawing

The distinctions among the periods of drawing were found to be not sharp and clear. In many the traces of an earlier stage persisted more or less sporadically in individuals who, for the most part, had arrived at a higher stage. Often, single drawings were found showing mixed characteristics in which traits from both earlier and later periods appeared.

The scribble stage.

The scribble stage of drawing has been outgrown for the most part by four year olds. However, a few examples of high scribble were found similar to the accompanying illustration.



Scribble



Periods of Drawing (continued)

The symbolic stage. Many four year old children and most of the five year olds were well beyond the symbolic period. The accompanying illustration shows progress beyond the meaningless scribble stage. This child had assigned definite meanings to his poorly controlled lines and was able to identify and explain the parts of his drawing when shown it later.

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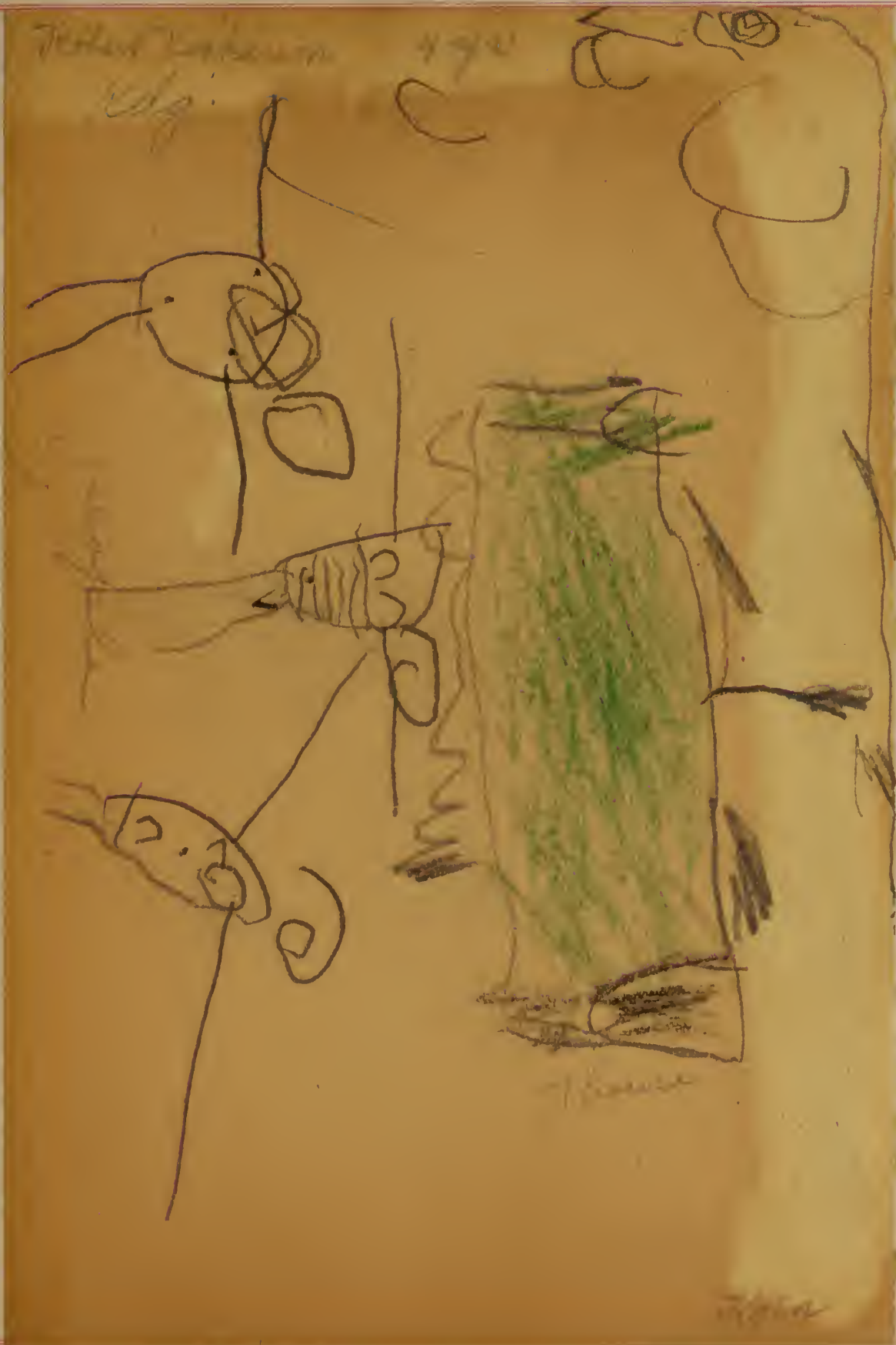
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Symbolic

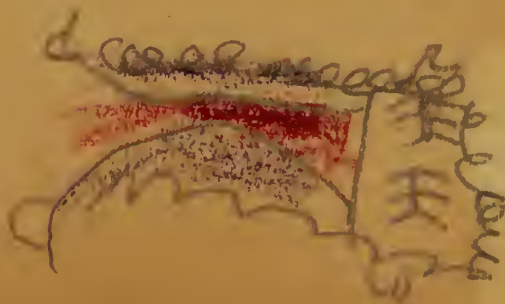
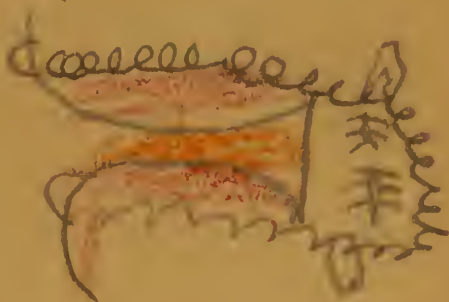


Periods of Drawing (continued)

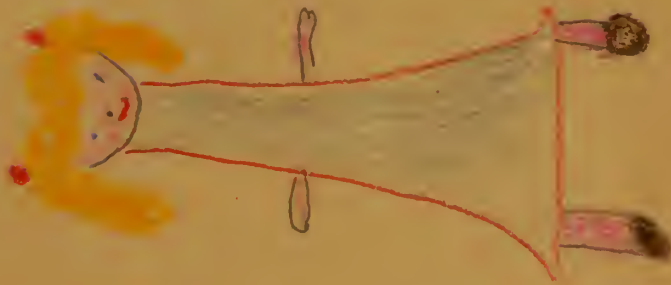
The Schematic Stage. The schematic stage of drawing was generally shown in the drawings of the five, six, and seven year old children. As will be seen in the accompanying drawing number one, the child's strange figures are not visual reproductions but formulae which are satisfactory to him. Often these formulae were made again and again for the satisfaction found in mere repetition of a familiar pattern.

Drawing number two by a seven year old represents a higher level of schematic drawing in that her figure formulae are somewhat closer to true representation of people, although the pattern for women and men are repeated exactly.

Louise
Orabel



Child's Name: _____
Date: _____



Periods of Drawing (Continued)

Logical Realism. In this period the children represent not only what they are able to see of an object, but all there is of the object as they know it. Logical realism was shown as early as four as can be seen by accompanying drawing number one in which the child drew the person inside as well as the side of the house.

In drawing number two, the seven year old child drew the flowers "tipped over" since she knew they grew on both sides of the path, although they could not appear that way to her.

In drawing number three, the eight year old child wished to draw two youngsters on the see-saw, and was not concerned that one was shown upside down.

In drawing number four, both ends of the house have been drawn because the child knew they existed even though they could not both be seen at once. This manner of representing houses was highly characteristic of the six, seven, and eight year old children.

In drawing number five, a nine year old was anxious to show the rows in the garden and was not disturbed that his representation of the garden shows it upright against the background. This type of representation appeared often in the work of the children from eight to ten years old.

THE HISTORY OF THE

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THE HISTORY OF THE

THE HISTORY OF THE

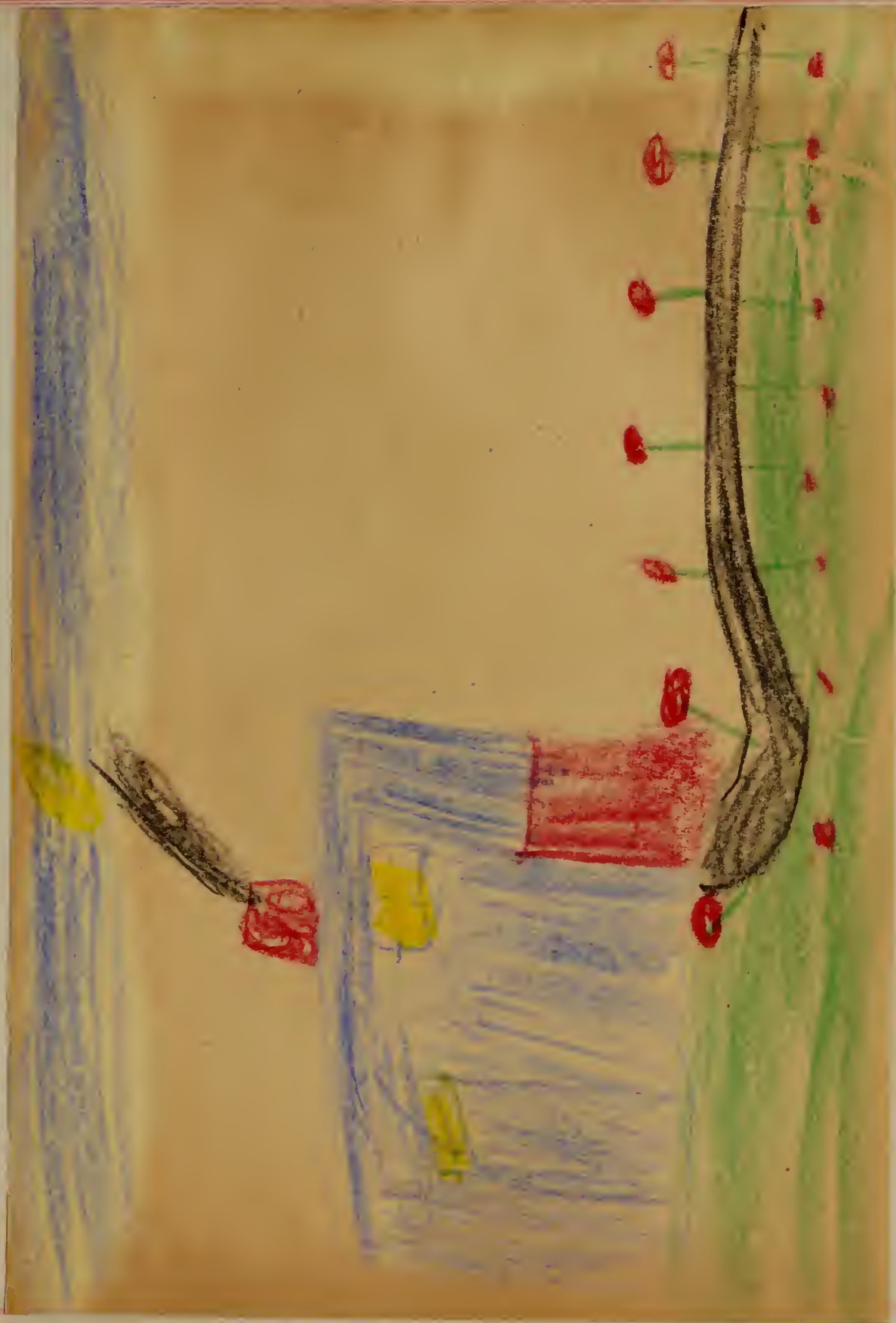
Sonny

7 yrs. old



When the car
is full of people
it is a bus.

Logical Realism - I



Logical Realism - II



Logical Realism -III





Logical Realism - IV





Logical Realism - V

In drawing number six, an eleven year old showed the river flowing between the house and garage as he knew it to do, but failed to realize that he had extended it above the horizon. Several other children in the same age group did the same thing in representing roads, paths, and brooks.

Drawing number seven, made by a twelve year old child exhibits an interesting transition from the stage of logical realism to the next stage of visual realism. The child showed evidence of visual realism in her treatment of house, background, and tricycles, but in drawing the flowers in the circular bed, she reverted to the earlier stage of logical realism.



Logical Realism - VI





Periods of Drawing (continued)

Visual Realism. In this period, the child attempts to represent objects correctly according to their appearance with more or less skill of execution. Many children who are without instruction never reach this adult level. In the total collection of drawings it was rarely shown in the work of any child younger than twelve.

The accompanying drawing by a twelve year old child shows a good attempt to apply certain principles of perspective.

1870

1871

1872

1873

1874

1875

1876

1877

1878

1879

1880

1881

1882

1883

1884

1885

1886

1887

1888

1889

1890

1891

1892

1893

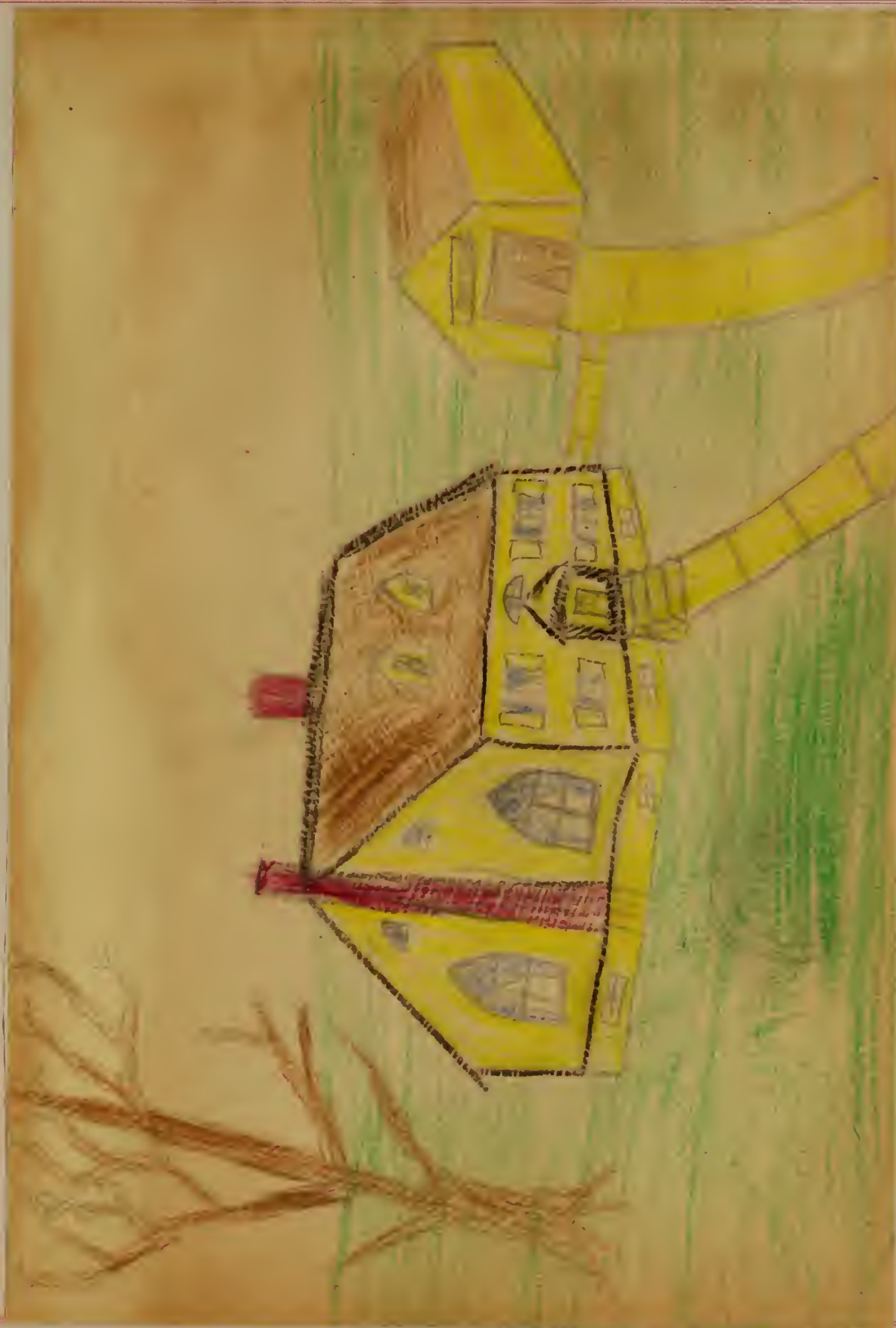
1894

1895

1896

1897

1898



Visual Realism



Stages in Representing the Human Figure

First Stage. The representation of the human figure has been found to pass through a series of stages which are said to appear successively. In the accompanying drawings the tadpole stage will be noted first. In the selected drawing will be seen the large round head with two lines for body and legs. There is much confusion as to number and placement of features. This kind of drawing was characteristic of the children in the five year old group.

THE HISTORY OF THE UNITED STATES OF AMERICA

The history of the United States of America is a story of a people who have built a great nation from a small colony. The story begins in 1492 when Christopher Columbus discovered the New World. The first English colony was founded in 1607 at Jamestown. The Pilgrims founded Plymouth in 1620. The American Revolution began in 1775 and ended in 1783. The Constitution was written in 1787. The Civil War was fought from 1861 to 1865. The United States became a world power in the late 19th century. The 20th century has been a time of great change and progress.



Human Figure - Stage I

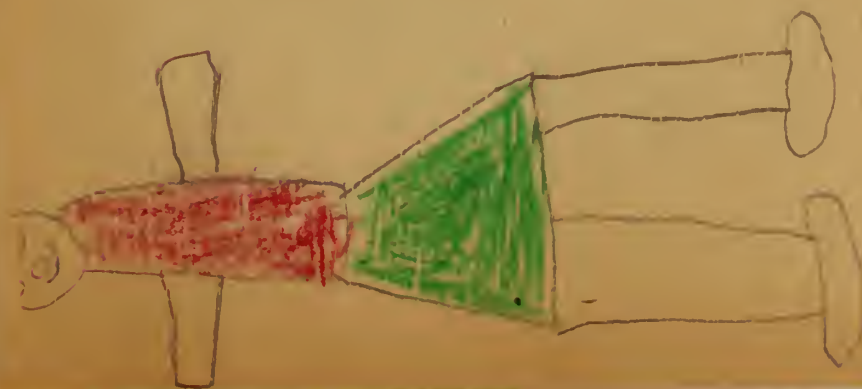


Stages in Representing the Human Figure

Second Stage. In the second stage it will be seen that the representation of the trunk appears and legs and feet have been drawn. An attempt had been made at appropriate costuming. This type of drawing appeared to be characteristic of the six year old drawings received.

THE HISTORY OF THE

... of the ...
... of the ...
... of the ...
... of the ...
... of the ...



Human Figure - Stage II

Stages in Representing the Human Figure

Third Stage. The third stage which was apparent generally in the drawings of the seven year old children shows a more complete full face showing of the human figure. Definite features, hair and arms have appeared and fingers are shown, although incorrect in number. The neck is not clearly shown.

THE HISTORY OF THE

... ..
... ..
... ..
... ..
... ..



Human Figure - Stage III

Stages in Representing the Human Figure

Fourth Stage. Change from full face representation to profile is a marked characteristic in the development of power to represent the human figure. This transition seemed to have been partially accomplished by the nine year old group, although many confusions persisted in the location of features and in alignment. In the drawings typical of this fourth stage often one figure was shown in correct profile, while in another figure, mixed profile was evident. Most of the nine year old children appeared to have reached this stage.

THE HISTORY OF THE UNITED STATES OF AMERICA

By J. M. Smith, Esq. of the City of New York.

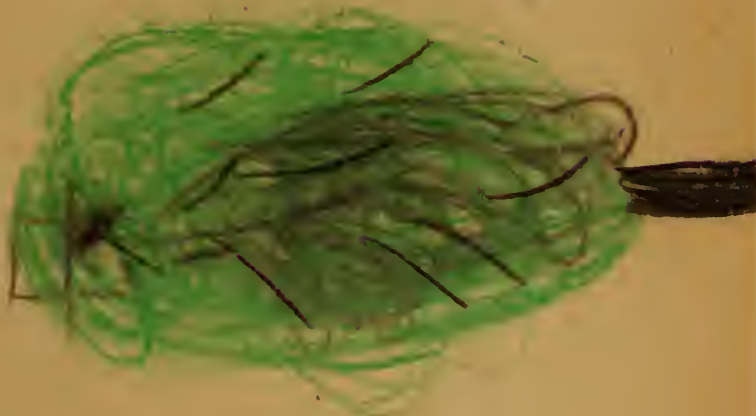
Published by J. M. Smith, Esq. of the City of New York.

1800.

Daddy



Baby



Mother



Stages in Representing the Human Figure

Fifth Stage. The last stage, the complete and correct representation of the profile was not characteristic of the drawings studied before the children had reached the age of thirteen, and even after that age confusions existed in many of the drawings. The full face drawings at this stage show accuracy in figure proportions and more detail and variety in costume representation.

THE HISTORY OF THE UNITED STATES

The first of these is the fact that the United States is a young nation, and that its history is a history of growth and development. The second is the fact that the United States is a nation of immigrants, and that its history is a history of the struggle for a better life. The third is the fact that the United States is a nation of free men, and that its history is a history of the struggle for freedom. The fourth is the fact that the United States is a nation of peace, and that its history is a history of the struggle for peace. The fifth is the fact that the United States is a nation of progress, and that its history is a history of the struggle for progress. The sixth is the fact that the United States is a nation of justice, and that its history is a history of the struggle for justice. The seventh is the fact that the United States is a nation of love, and that its history is a history of the struggle for love. The eighth is the fact that the United States is a nation of hope, and that its history is a history of the struggle for hope. The ninth is the fact that the United States is a nation of faith, and that its history is a history of the struggle for faith. The tenth is the fact that the United States is a nation of courage, and that its history is a history of the struggle for courage. The eleventh is the fact that the United States is a nation of strength, and that its history is a history of the struggle for strength. The twelfth is the fact that the United States is a nation of wisdom, and that its history is a history of the struggle for wisdom. The thirteenth is the fact that the United States is a nation of power, and that its history is a history of the struggle for power. The fourteenth is the fact that the United States is a nation of glory, and that its history is a history of the struggle for glory. The fifteenth is the fact that the United States is a nation of honor, and that its history is a history of the struggle for honor. The sixteenth is the fact that the United States is a nation of respect, and that its history is a history of the struggle for respect. The seventeenth is the fact that the United States is a nation of dignity, and that its history is a history of the struggle for dignity. The eighteenth is the fact that the United States is a nation of pride, and that its history is a history of the struggle for pride. The nineteenth is the fact that the United States is a nation of joy, and that its history is a history of the struggle for joy. The twentieth is the fact that the United States is a nation of happiness, and that its history is a history of the struggle for happiness. The twenty-first is the fact that the United States is a nation of peace, and that its history is a history of the struggle for peace. The twenty-second is the fact that the United States is a nation of love, and that its history is a history of the struggle for love. The twenty-third is the fact that the United States is a nation of hope, and that its history is a history of the struggle for hope. The twenty-four is the fact that the United States is a nation of faith, and that its history is a history of the struggle for faith. The twenty-fifth is the fact that the United States is a nation of courage, and that its history is a history of the struggle for courage. The twenty-six is the fact that the United States is a nation of strength, and that its history is a history of the struggle for strength. The twenty-seventh is the fact that the United States is a nation of wisdom, and that its history is a history of the struggle for wisdom. The twenty-eighth is the fact that the United States is a nation of power, and that its history is a history of the struggle for power. The twenty-ninth is the fact that the United States is a nation of glory, and that its history is a history of the struggle for glory. The thirtieth is the fact that the United States is a nation of honor, and that its history is a history of the struggle for honor. The thirty-first is the fact that the United States is a nation of respect, and that its history is a history of the struggle for respect. The thirty-second is the fact that the United States is a nation of dignity, and that its history is a history of the struggle for dignity. The thirty-third is the fact that the United States is a nation of pride, and that its history is a history of the struggle for pride. The thirty-four is the fact that the United States is a nation of joy, and that its history is a history of the struggle for joy. The thirty-fifth is the fact that the United States is a nation of happiness, and that its history is a history of the struggle for happiness. The thirty-six is the fact that the United States is a nation of peace, and that its history is a history of the struggle for peace. The thirty-seventh is the fact that the United States is a nation of love, and that its history is a history of the struggle for love. The thirty-eighth is the fact that the United States is a nation of hope, and that its history is a history of the struggle for hope. The thirty-ninth is the fact that the United States is a nation of faith, and that its history is a history of the struggle for faith. The fortieth is the fact that the United States is a nation of courage, and that its history is a history of the struggle for courage. The forty-first is the fact that the United States is a nation of strength, and that its history is a history of the struggle for strength. The forty-second is the fact that the United States is a nation of wisdom, and that its history is a history of the struggle for wisdom. The forty-third is the fact that the United States is a nation of power, and that its history is a history of the struggle for power. The forty-four is the fact that the United States is a nation of glory, and that its history is a history of the struggle for glory. The forty-fifth is the fact that the United States is a nation of honor, and that its history is a history of the struggle for honor. The forty-six is the fact that the United States is a nation of respect, and that its history is a history of the struggle for respect. The forty-seventh is the fact that the United States is a nation of dignity, and that its history is a history of the struggle for dignity. The forty-eighth is the fact that the United States is a nation of pride, and that its history is a history of the struggle for pride. The forty-ninth is the fact that the United States is a nation of joy, and that its history is a history of the struggle for joy. The fiftieth is the fact that the United States is a nation of happiness, and that its history is a history of the struggle for happiness.



Age 13 - Grade 7

Human Figure - Stage V

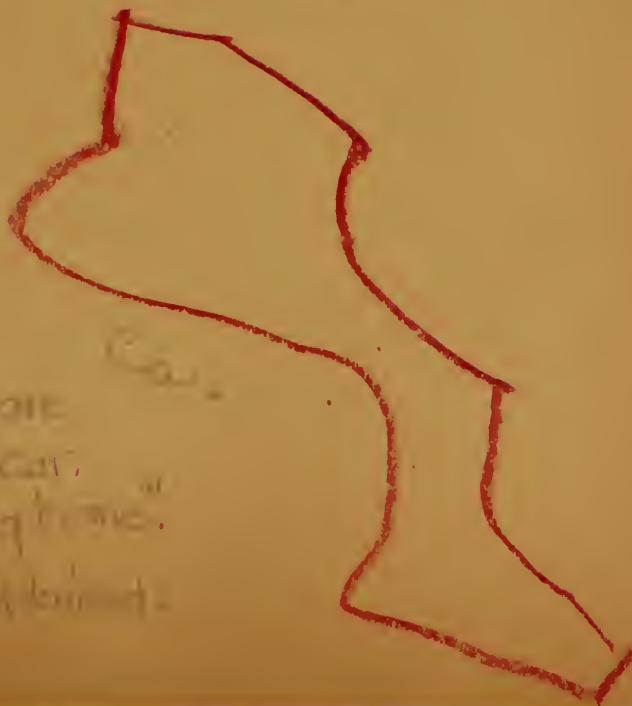
Stages of Representation of Movement

It will be seen from the accompanying drawings that these children showed a general parallelism between advance in age and ability to reproduce movement.

First Stage. In the first stage, the child merely drew the separate objects and announced the action verbally to the teacher. Many of the children in the four, five, and six year old groups did this same type of drawing.

Kathleen 6

S.T.

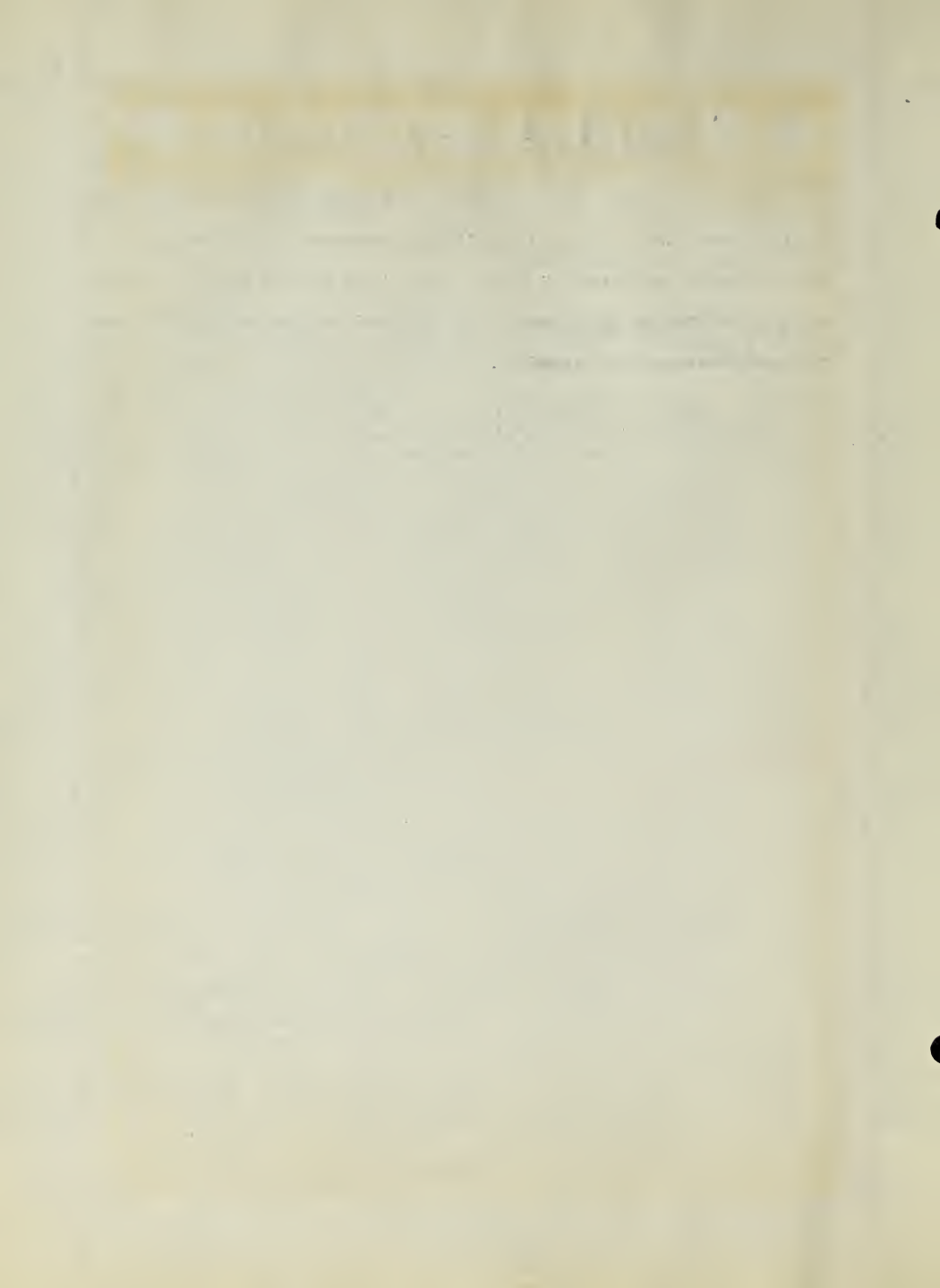


The said
The children are
running to the car.
They are going home.
and all 13 are blind.

Movement- Stage I

Stages of Representation of Movement

Second Stage. In the second stage which was reached by most of the seven year old children movement was shown by some form of relationship in which lines were drawn from one object to others to suggest the desired action as can be seen in the accompanying drawing.



Norman 7



Gravel

Movement - Stage II



Stages of Representation of Movement

Third Stage. In the third stage which was reached by most nine year olds, movement was shown by some form of relationship in which one part of the body pattern was altered, as a raised leg or outstretched arm, while the remainder of the figure remained stereotyped and static.

1

THE HISTORY OF THE

of the world, from the beginning of time to the present day. This history is divided into three parts: the first part contains the history of the world from the beginning of time to the present day; the second part contains the history of the world from the present day to the future; and the third part contains the history of the world from the future to the end of time.



Movement - Stage III

Stages of Representation of Movement

Fourth Stage. In the fourth stage the entire drawings depict motion. It will be seen in the accompanying drawing that the child drew each figure so as to suggest appropriate action and the complete figure pattern was correctly altered to show the movement intended. This stage was not characteristic of any age group younger than twelve.

REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE

FOR THE YEAR 1871

IN RESPONSE TO A RESOLUTION OF THE HOUSE OF COMMONS, PASSED IN 1869, RELATIVE TO THE LANDS BELONGING TO THE CROWN.

BY THE COMMISSIONER OF THE GENERAL LAND OFFICE, JOHN R. H. PHILLIPS.

LONDON: PRINTED BY THE STATIONER, ROYAL PRINTING OFFICE, 1871.



Movement - Stage IV

Spatial Orientation

Lack of correct power of spatial orientation was frequently seen in the drawings of the children from four to seven and occasionally in the work of those eight and nine years old and even older. Evidences can be seen in the accompanying pictures.

In drawing number one, the house was drawn first and then the windows were drawn separately beside the house. The child was not able to synthesize the complete idea of house and windows in the single pattern.

Richard,
K. Age 5



Spatial Orientation - I.

Spatial Orientation

In drawing number two, a six year old has drawn grass and sky, but has failed to portray the correct relationship between the figures and the earth and sky, and so has drawn the figures upside down. This was seen occasionally in the work of children younger than seven.

THE HISTORY OF THE

... of the ...
... of the ...
... of the ...
... of the ...
... of the ...



Spatial Orientation - II

Spatial Orientation

In drawing number three, a seven year old had difficulty in comprehending depth and opacity and so he drew the woman who lives in the house as under the roof and inside the house, but visible through the side of it.

CHAPTER I

The first part of the book is devoted to a general survey of the history of the subject, and to a discussion of the various theories which have been advanced to explain the origin of the human mind. The second part is devoted to a detailed examination of the various theories which have been advanced to explain the origin of the human mind.



Spatial Orientation - III

Perspective

Perspective representation requires a degree of abstract thinking of which, according to experimental evidence,^{1/} young children are not capable. Up to the age of fourteen children do not perceive clearly how dimensions of objects vary with the distance or the position from which they are seen. The accompanying drawings show treatments of perspective which were found to be characteristic of the age groups making them.

In the first drawing, made by a five year old, the objects are scattered over the page. The child had drawn what she knew of the objects without thinking of their appearance from a distance or of their relationships to one another.

In the second drawing, made by a seven year old, a partially successful attempt has been made to bring parts into closer relationships with one another.

In drawings III and IV, the exceptionally able five and six year olds have advanced to the level of placing objects in a row in linear space; however, they show only full face views. In drawing number five, the eleven year old child has arranged the figures and objects in ranked rows and has made a partially correct attempt to show the relation of size to distance.

^{1/} Helga Eng, op. cit., p.152.

In drawing VI, a similar idea has been more elaborately worked out by a ten year old. The child has also attempted to show placement in this scene by superimposing one tree upon another, although he has made the pointed tree the same size regardless of their placement in the picture. A definite horizon appears at this level.

In drawing VII by a twelve year old the placement of objects on the page low or high whereby they are brought into more nearly correct relationships of size and distance, shows a definite advance over the work in drawing VI.

Drawing number VIII, made by a fourteen year old, shows a clear recognition of the relationship of size to distance and the foreshortening used in representing a house has been quite successful. Many children do not reach this level.

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

Perspective



Narrative Drawing

The illustration of the fact that drawing is a form of language for children was shown to a marked degree in the drawings studied. The younger children made fragmentary pictures. Actual scenes were not often shown completely, but isolated figures were scattered over the paper without organization, as illustrated by drawing number one, by a seven year old child. As the children matured, they began to produce narrative pictures. The scenes or phases of the picture could be distinguished with increasing clearness. The component parts came to be recorded with increasing accuracy and detail. This sequence of growth was markedly apparent in the complete collection of drawings as it is in the accompanying samples.

Drawing number two by an eight year old tells simply of the children's play activities, whereas drawing number three by a ten year old shows the effect of a much wider range of interest and imagination. However, it was not found to be common before the age of eleven that the full details of background were portrayed in completeness as is shown by drawings four and five made by eleven year old children. Drawing number six by a twelve year old shows further advancement in the fact details as shown in the chair covering, in the drawing of the radio and the lettering on the game which the children are using, are included painstakingly and exactly.

Narration

Growth in Narrative Drawing.

I



II



III





IV



V



VI

Proportion

A lack of correct proportion was generally evident in the work of most of the children, and the lack persisted into the upper age groups very generally except in the cases of children of high ability. It was found that relationships of separate parts of an object to one another and the respective relations of persons and objects in compositions were often faulty. Children make large that which holds the greatest interest value for them. Exaggeration of suns, chimneys with the smoke coming out, shoes and buttons on clothing, was very common.

In drawing number one, it can be seen that the head is much too large and the body much too long and thin.



Proportion - I



Proportion

In drawing number two, the flowers and trees are about the same size, and the house is not in correct comparison with either.

1871

Received of the Hon. Secy. of the Interior
the sum of \$100.00 for the year 1871
J. H. Smith



Proportion - II

Proportion

In drawing number three, although the work of an older child, the figures are excessively large in comparison to the building.

1872

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Proportion - III

Individual Differences

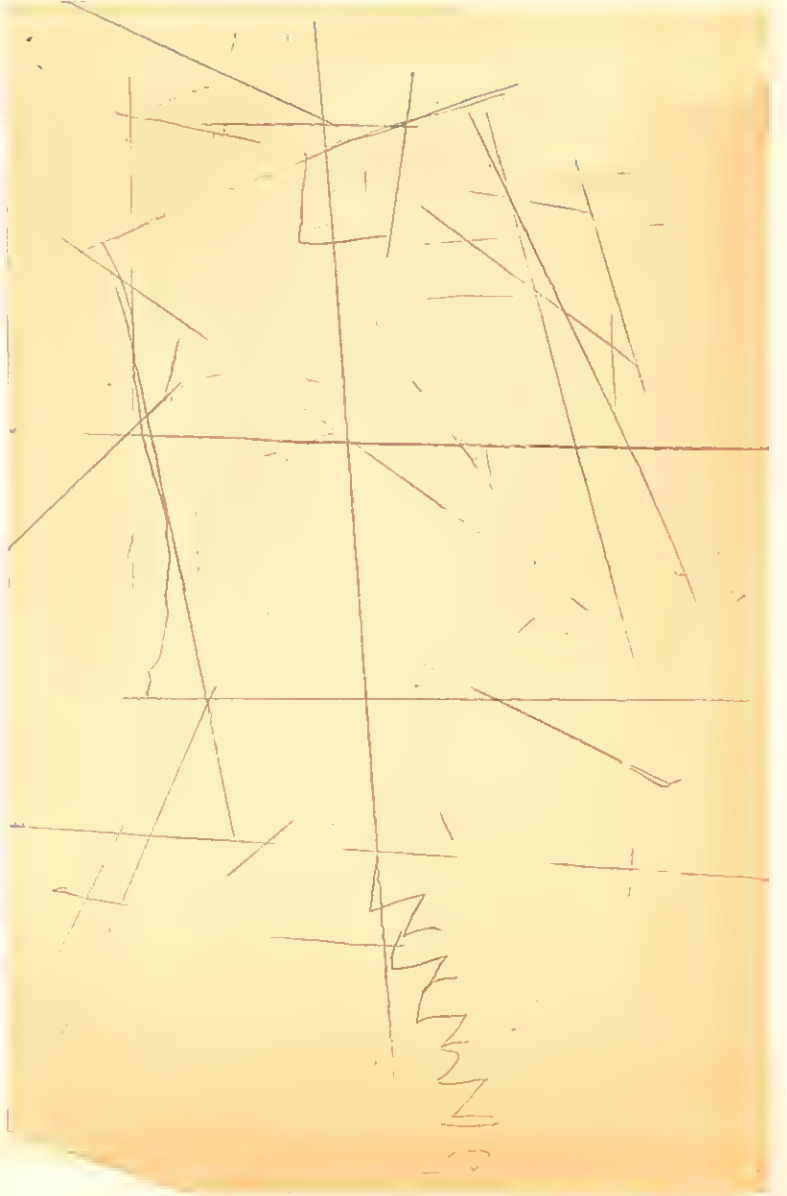
Examination of the 2289 drawings has shown that a fairly high relationship exists between developmental progress as shown in drawing and educational progress as shown by grade placement.

Inspection of the accompanying house and figure drawings done by two twelve year old children reveals this fact most vividly. Both children are twelve years old, but one is placed in grade six in school and the other in grade one. The drawings of the sixth grade child show high ability to represent ideas through drawing with accuracy and detail. The drawings of the other who is in grade one, are barely beyond the scribble stage.

Individual
Differences - 12

Individual Differences

Child
A-1
Age
12
Grade I



Child
B-1
Age
12
Grade
VI



Individual Differences

A similar contrast is shown to nearly as great a degree by the work of two nine year old children. One is placed in grade four at school, and the other in grade two.

Individual
Differences - 9

Individual Differences

Child
C-1
Age
9
Grade
II



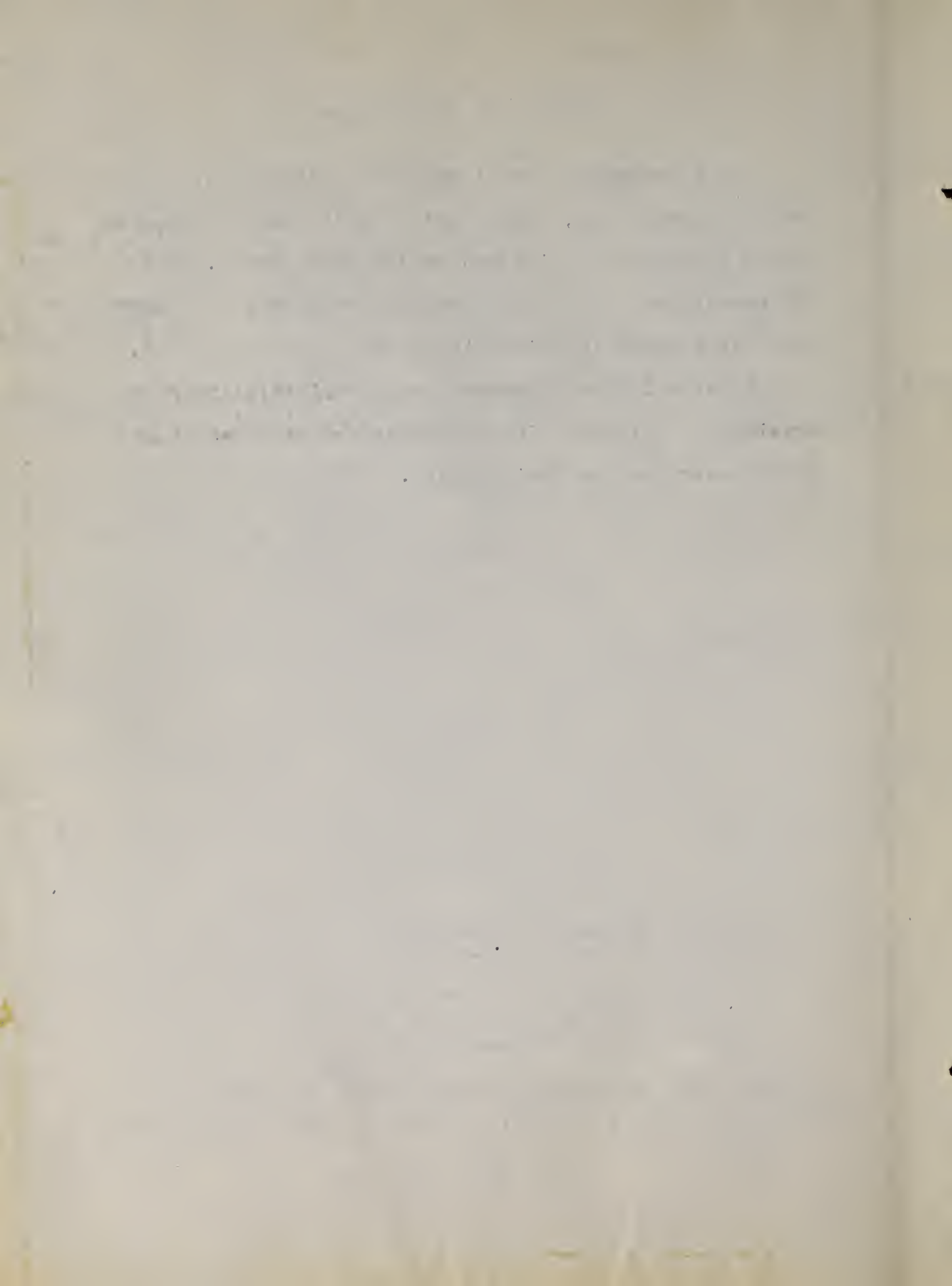
Child
D-1
Age
9
Grade
IV



Individual Differences

The accompanying drawings of two six year olds show great contrast also, though not to quite as marked a degree as was shown at the nine and twelve year levels. This difference is not so great probably because not so much time has elapsed in which divergence might take place.

Bizarre figures appeared characteristically in the drawings of children nine and under who were two or more years over age for their grades.



Individual
Differences -6

Individual Differences



Child
E-1
Age
6
Grade
I



Child
F-1
Age
6
Grade
I



Particular Difficulties

Automatism. It was found in the drawings examined that a few children in the age groups from four to seven showed evidence of automatism in their work. It was seen that simple forms had been frequently and often rhythmically repeated. After a sufficient number of repetitions, the process finally seemed to be quite mechanical.

Krotzsch believes:

Automatism rules in the drawing of mentally deranged and abnormal persons, and it can also appear in normal adults when in a state of diminished consciousness; if one is bored with a lecture, or telephoning, and so on, one begins quite automatically to draw simple lines and figures which are repeated rhythmically without any representative intention. ^{1/}

Transparency. Evidence that younger children draw what they know to be true rather than what they observe is shown by the accompanying drawing. The child has drawn the exterior of a house and also certain articles inside it. This tendency to transparency was found to be fairly frequent in the younger age groups.

^{1/} W. Krotzsch, Rhythmus und Form in der freien Kinderzeichnung, Leipzig, 1917, p.19.



Automatism



Transparency

Color

Color. Color was used very generously by all but about ten per cent of the children. The children who did not use color were in the lower age groups of four to seven and for the most part did inferior drawings. The remainder who did not use color were eleven and twelve year olds in a single school where they recently had had a series of lessons on house drawing in which color had not been used, and it was felt that this influence persisted.

No attempt was made to determine what colors were preferred.

It is a very interesting paper, and one which
you will find very interesting. I have the pleasure to tell you
that it is now in the hands of the printer, and will be
ready for the press in a few days. The paper is of a fine
quality, and the printing is of a high order. I have the
pleasure to tell you that it is now in the hands of the
printer, and will be ready for the press in a few days.
I have the pleasure to tell you that it is now in the
hands of the printer, and will be ready for the press in
a few days. I have the pleasure to tell you that it is
now in the hands of the printer, and will be ready for
the press in a few days. I have the pleasure to tell you
that it is now in the hands of the printer, and will be
ready for the press in a few days. I have the pleasure to
tell you that it is now in the hands of the printer, and
will be ready for the press in a few days. I have the
pleasure to tell you that it is now in the hands of the
printer, and will be ready for the press in a few days.

Yours truly,
J. M. Smith

CHAPTER IV

GENERAL CONCLUSIONS

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The study of 2289 drawings made by children from the ages four to sixteen years was undertaken to determine whether or not growth and development on the part of children would be revealed in their drawings. It was purposed to study their drawings with respect to growth through successive age levels, the general stages of drawing, the stages in figure drawing, representation of movement, spatial orientation, perspective representation, proportion, narration, individual differences, and peculiarities, and then to compare the work at the various age levels with respect to these elements.

The study indicates the following to be true :

1. Growth and development were clearly apparent in the drawings of children at successive age levels.
2. The stages of drawing overlapped.
3. A general parallelism was found between ability to represent movement and advance in age.
4. Lack of correct power of spatial orientation was frequently seen in the drawings of children from four to seven years, and occasionally in those of eight to twelve years.

5. Perspective representation advanced with age, but up to the age of fourteen was not capably handled.
6. The use of drawing to express narration was clearly parallel with advancing age.
7. A lack of correct proportion was generally evident in the work of children in all of the age groups studied.
8. Wide individual differences existed.
9. A fairly high relationship was found to exist between developmental progress as shown in drawing and educational progress as shown by grade placement.
10. Color was used by most of the children at all age levels.

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Growth in Figure Drawing.

Quality

High



Average



Low



Age

7

7

7

Quality

High



Average



Low



Age

8

8

8

Quality

High



Average



Low



Age

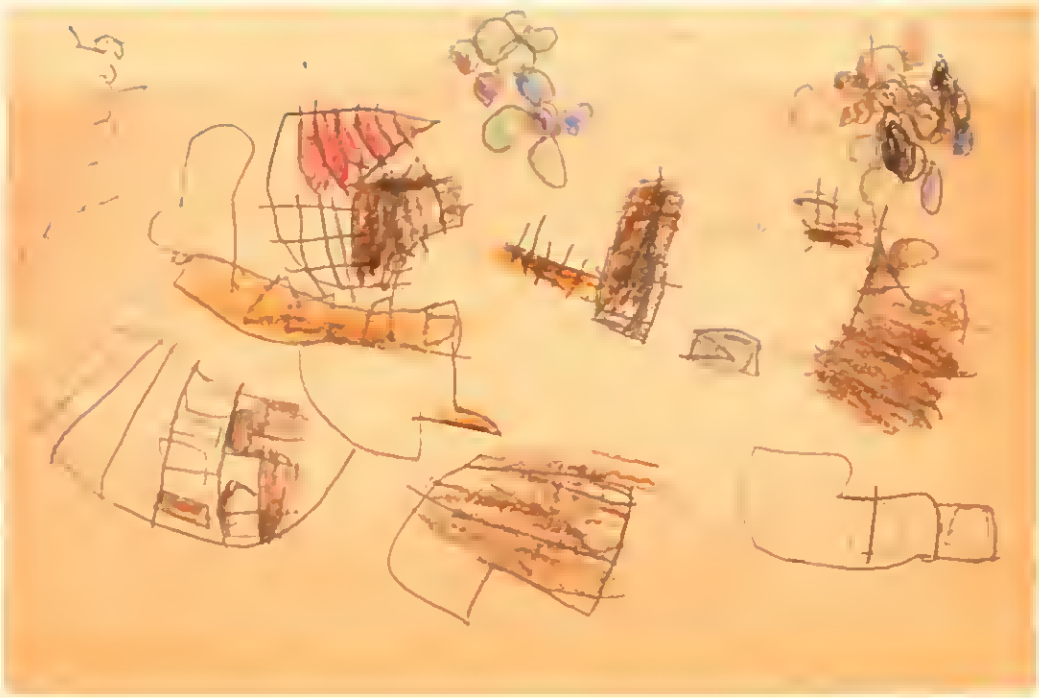
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Figures 7-8-9

Growth in Representation of Perspective.



Perspective

BOSTON UNIVERSITY



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Thesis
Mahoney, E.M.
1946

Mahoney, E.M.

An analysis of children's
drawing-ages four to fourteen
inclusive.

